Subpart 10.20—Motorboat Operators' Licenses

§ 10.20–9 [Amended]

6. Section 10.20–9 *Requirements for renewal* is amended in paragraph (a)(1) by changing a reference to Coast Guard Form from "CG–3479" to "CG–866, License and Renewal Application".

SUBCHAPTER C—UNINSPECTED VESSELS

PART 25—REQUIREMENTS

Subpart 25.05—Navigation Lights and Shapes, Whistles, Foghorns, Fog Bells, and Gongs

1. The heading for Subpart 25.05 is amended to read as set forth above.

2. Section 25.05–1 is amended to read as follows:

§ 25.05–1 Vessels operating on waters governed by the International Rules of the Road.

(a) All vessels (including motorboats) operating on waters governed by the International Rules of the Road (33 U.S.C. 1051–1094) shall be equipped with the navigation lights and shapes, whistles, foghorns, fog bells, and gongs as required by those rules.

§ 25.05–5 [Canceled]

3. Section 25.05–5 *Motorboats* is canceled.

4. Subpart 25.05 is amended by adding the following new section:

§ 25.05–10 Vessels operating on waters governed by the Inland, Great Lakes, or Western Rivers Rules of the Road.

(a) All vessels, other than motorboats, operating on waters governed by the Inland, Great Lakes, or Western Rivers Rules of the Road (33 U.S.C. 154–232, 241–295, 301–355) shall be equipped with the navigation lights and shapes, whistles, foghorns, fog bells, and gongs as required by the Rules of the Road applicable to the waters on which the vessel is navigated.

(b) All motorboats operating on waters governed by the Inland, Great Lakes, or Western Rivers Rules of the Road shall be equipped with the following:

(1) Navigation lights as set forth in the Motorboat Act of April 25, 1940, as amended (46 U.S.C. 526–526u) or, in lieu thereof, the lights required by the International Rules of the Road.

(2) An efficient whistle or other sound producing mechanical device as set forth in Table 25.05–10(b)(2), except:

(i) Motorboats engaged in a race which has been previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race, need not carry the devices required by Table 25.05–10(b)(2).

TABLE 25.05–10(b)(2)

Class of motorboat	Type of device
A (less than 16 feet in length).	None required by law.
1 (16 feet or over, and less than 26 feet in length).	Mouth, hand, or power operated, capable of producing a blast of 2 seconds or more duration, and audible for at least one-half mile.
2 (26 feet or over, and less than 40 feet in length).	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
3 (40 feet or over, and not over 65 feet in length).	Power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.

(3) An efficient fog bell, except that the following motorboats need not carry such a bell:

(i) Motorboats of less than 26 feet in length (Classes A and 1).

(ii) Motorboats engaged in a race previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race.

(R.S. 4405, as amended, 4462, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 375, 416, 526p; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

Subpart 25.10—Whistles [Canceled]

5. Subpart 25.10, consisting of §§ 25.10–1 to 25.10–10, inclusive, is canceled.

§ 25.10–1 [Canceled]

6. Section 25.10–1 *Vessels other than sailing vessels, barges, and motorboats* is canceled.

§ 25.10–5 [Canceled]

7. Section 25.10–5 *Motorboats operating on the high seas* is canceled.

§ 25.10–10 [Canceled]

8. Section 25.10–10 *Motorboats operating on the navigable waters of the United States* is canceled.

Subpart 25.15—Foghorns [Canceled]

9. Subpart 25.15, consisting of §§ 25.15–1 and 25.15–5, is canceled.

§ 25.15–1 [Canceled]

10. Section 25.15–1 *Vessels other than motorboats* is canceled.

§ 25.15–5 [Canceled]

11. Section 25.15–5 *Motorboats* is canceled.

Subpart 25.20—Fog Sound Signal Devices [Canceled]

12. Subpart 25.20, consisting of §§ 25.20–1 to 25.20–10, inclusive, is canceled.

§ 25.20–1 [Canceled]

13. Section 25.20–1 *Vessels other than motorboats* is canceled.

§ 25.20–5 [Canceled]

14. Section 25.20–5 *Motorboats operating on the high seas* is canceled.

§ 25.20–10 [Canceled]

15. Section 25.20–10 *Motorboats operating on the navigable waters of the United States* is canceled.

(R.S. 4405, as amended, 4462, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 375, 416, 526p; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

SUBCHAPTER D—TANK VESSELS

PART 30—GENERAL PROVISIONS

Subpart 30.10—Definitions

Section 30.10–39 is amended to read as follows:

§ 30.10–39 Liquefied flammable gas—TB/ALL.

The term "liquefied flammable gas" means any flammable gas having a Reid vapor pressure exceeding 40 pounds, which has been liquefied.

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026)

PART 31—INSPECTION AND CERTIFICATION

Subpart 31.10—Inspections

§ 31.10–1 [Amended]

Section 31.10–1 *Recognized classification society—TB/ALL* is amended by changing in the last sentence of paragraph (b) the ZIP Code number for the Coast Guard from "20236" to "20226".

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 32—SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS

Subpart 32.15—Navigation Equipment

1. Section 32.15–10 is amended to read as follows:

§ 32.15–10 Sounding machines—T/OCL.

All mechanically propelled vessels in ocean or coastwise service of 500 gross tons and over, and all mechanically propelled vessels in Great Lakes service of 500 gross tons and over certificated for service on the River St. Lawrence eastward of the lower exit of the St. Lambert Lock at Montreal, Canada, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus and a deep-sea hand lead. All other mechanically propelled vessels in Great Lakes service of 1,500 gross tons and over shall carry a deep-sea hand lead.

Subpart 32.45—Electrical Installations

2. Section 32.45–1 is amended by revising paragraphs (f)(1) and (h)(2) to read as follows:

§ 32.45–1 Requirements for tank vessels the construction or conversion of which is contracted for on or after November 19, 1955—TB/ALL.

* * * * *

(f) *Enclosed spaces.* (1) The lighting of enclosed spaces immediately above or adjacent to cargo tanks for Grade A, B, C, or D liquid cargo shall be effected by means of approved explosion-proof or magazine type lighting fixtures in accordance with the requirements of § 111.70–10(c) of Subchapter J (Electrical Engineering) of this chapter.

* * * * *

(h) *Cargo pumproom handling Grade A, B, C, or D liquid cargo.* * * *

(2) Through runs of electric cable, regardless of how they may be protected, are prohibited, except that cables which are a part of the intrinsically safe circuitry of an approved installation are specifically exempt from this restriction.

* * * * *

Subpart 32.55—Ventilation and Venting

3. The headnote for § 32.55–10 is amended to read as follows:

§ 32.55–10 Ventilation of tank vessels contracted prior to November 10, 1936—TB/ALL.

Subpart 32.57—Structural Fire Protection for Tank Vessels Contracted for on or After January 1, 1963

4. Section 32.57–10(f) is amended by changing the word from "inflammable" to "flammable" so that it will read as follows:

§ 32.57–10 Construction—TB/ALL.

* * * * *

(f) Nitrocellulose or other highly flammable or noxious fume-producing paints or lacquers shall not be used.

Subpart 32.70—Hull Requirements for Steel Hull Tank Vessels Constructed Prior to November 10, 1936

5. Section 32.70–5 is amended by changing the word "inflammable" to "flammable" in the first sentence so that the section reads as follows:

§ 32.70–5 Hull requirements; general—TB/ALL.

The scantlings, material, and workmanship, the subdivision of cargo spaces, the arrangement of cofferdams, the testing of tanks and cofferdams, shall be at least equivalent to the requirements of a recognized classification society for the particular service specified in the application for the certificate of inspection and permit for the transportation of liquid flammable cargoes in bulk as of the date when the tank vessel was built or as of the date when the vessel was converted into a tank vessel. In the absence of such classification requirements, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel's structure as specified in this section is safe for the service to be specified in its certificate of inspection.

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026)

PART 33—LIFESAVING APPLIANCES

Subpart 33.35—Life Preservers

1. Section 33.35–1 is amended by revising paragraphs (a) and (b) to read as follows:

§ 33.35–1 Number and type required—TB/ALL.

(a) All tank vessels shall be provided with one approved life preserver for each person carried. An additional number of life preservers shall be provided for personnel on watch in the engineroom and pilothouse, and at the bow lookout.

(b) When children are carried, a suitable number of children's life preservers shall be provided.

* * * * *

2. Section 33.35–5 is amended to read as follows:

§ 33.35–5 Distribution and stowage—TB/ALL.

Life preservers shall be distributed throughout the cabins, staterooms, berths, and other places convenient for each person on such tank vessels. The stowage of the additional number of life preservers shall be such that they are readily accessible to personnel on watch in the engineroom and pilothouse, and at the bow lookout.

Subpart 33.55—Line-Throwing Appliances

3. Section 33.55–5 is amended by changing at the end of the first sentence the phrase "read for use" to "ready for use" so that the section as revised will read as follows:

§ 33.55–5 Accessibility—T/OC.

The line-throwing appliance and its equipment shall be kept always easily and immediately accessible and ready for use. No part of this equipment shall be used for any other purpose.

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 34—FIREFIGHTING EQUIPMENT

Subpart 34.15—Carbon Dioxide Extinguishing Systems, Details

Section 34.15–90(a)(7) is amended by changing in the first sentence the phrase from "shall be noted in Table 34.15–90(a)(7)" to "shall be as noted in Table 34.15–90(a)(7)" so that the text of this paragraph reads as follows:

§ 34.15–90 Installations contracted for prior to January 1, 1962—T/ALL.

(a) * * *

(7) Branch lines to the various spaces other than cargo and similar spaces shall be as noted in Table 34.15–90(a)(7). This table is based on cylinders having discharge outlets and siphon tubes of ⅜-inch diameter.

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 35—OPERATIONS

Subpart 35.20—Navigation

1. Section 35.20–1 is amended to read as follows:

§ 35.20–1 Notice to mariners; aids to navigation—T/OCLB.

(a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the U.S. Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(b) Weekly Notices to Mariners (Great Lakes Edition), published by the Commander, 9th Coast Guard District, contain announcements and information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained free of charge, by making application to Commander, 9th Coast Guard District.

(c) Weekly Notices to Mariners (Part I, Atlantic and Mediterranean) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 1st, 3d, 5th, 7th, and 8th Coast Guard Districts and the Greater Antilles Section. Foreign marine information in the Atlantic and Mediterranean area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(d) Weekly Notices to Mariners (Part II, Pacific and Indian Oceans) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 11th, 12th, 13th, 14th, and 17th Coast Guard Districts. Foreign marine information in the Pacific and Indian Oceans area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office,

Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(e) All vessels shall have charts of the waters on which they operate for convenient reference at all times.

Subpart 35.35—Cargo Handling

§ 35.35–5 [Amended]

2. Section 35.35–5 is extended in application to "barges," and to show this extension the headnote is changed from "Electric bonding—T/ALL" to "Electric bonding—TB/ALL."

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 36—ELEVATED TEMPERATURE CARGOES

Subpart 36.01—General

§ 36.01–5 [Amended]

Section 36.01–5 *Certificate of inspection—TB/ALL* is amended by changing the U.S. Code citation following paragraph (a) from "46 U.S.C. 339" to "46 U.S.C. 399."

(R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 38—LIQUEFIED FLAMMABLE GASES

Part 38 is amended to read as follows:

Subpart 38.01—General

Sec.
38.01–1 Scope of regulations—TB/ALL.
38.01–2 Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces—TB/ALL.
38.01–5 Certificate of inspection—TB/ALL.

Subpart 38.05—Design and Installation

38.05–1 Design and construction of vessels—general—TB/ALL.
38.05–2 Design and construction of cargo tanks—general—TB/ALL.
38.05–3 Design and construction of pressure vessel type cargo tanks—TB/ALL.
38.05–4 Design and construction of nonpressure vessel type cargo tanks—TB/ALL.
38.05–5 Markings—TB/ALL.
38.05–10 Installation of cargo tanks—general—TB/ALL.
38.05–20 Insulation—TB/ALL.
38.05–25 Refrigerated systems—TB/ALL.

Subpart 38.10—Piping, Valves, Fittings, and Accessory Equipment

38.10–1 Valves, fittings, and accessories—TB/ALL.
38.10–5 Filling and discharge pipes—TB/ALL.
38.10–10 Cargo piping—TB/ALL.
38.10–15 Safety relief valves for pressure vessel type tanks—TB/ALL.
38.10–16 Safety relief valves for nonpressure vessel type tanks—TB/ALL.
38.10–20 Liquid level gaging devices—TB/ALL.

Subpart 38.15—Special Requirements

Sec.
38.15–1 Filling of tanks—TB/ALL.
38.15–5 Cargo hose—TB/ALL.
38.15–10 Leak detection systems—T/ALL.
38.15–15 Electrical installations—TB/ALL.
38.15–20 Remote shutdowns—TB/ALL.

Subpart 38.20—Venting and Ventilation

38.20–1 Venting—T/ALL.
38.20–5 Venting—B/ALL.
38.20–10 Ventilation—T/ALL.

Subpart 38.25—Periodic Tests and Inspections

38.25–1 Tests and inspections—TB/ALL.
38.25–5 Removal of defective tanks—TB/ALL.
38.25–10 Safety relief valves—TB/ALL.

AUTHORITY: The provisions of this Part 38 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 38.01—General

§ 38.01–1 Scope of regulations—TB/ALL.

(a) The regulations in this part contain requirements for the transportation of liquefied or compressed gases, whose primary hazard is one of flammability.

(b) The transportation "on deck" of liquefied flammable gases in portable cylinders and tanks and the transportation of empty cylinders and portable tanks previously used shall be in accordance with the requirements of Part 146 of Subchapter N (Dangerous Cargoes) of this chapter. The transportation of such containers "under deck" shall be in accordance with the requirements of § 38.01–2.

§ 38.01–2 Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces—TB/ALL.

(a) ICC cylinders, ICC Specification portable tanks, or other approved portable tanks containing liquefied flammable gases may be transported under deck, provided the following requirements are met:

(1) The cargo space shall be provided with efficient means of ventilation, be protected from artificial heat, and be readily accessible from hatches.

(2) Containers shall be stored in such a position that the safety relief device is in communication with the vapor space of the container. They shall be properly stowed, dunnaged, and secured to prevent movement in any direction.

(3) Unless a method acceptable to the Commandant is used, the containers shall not be overstowed in the same dry cargo space with other liquefied flammable gas containers, nor with other cargo.

(4) The containers shall be suitably protected against physical damage from other cargo, ship's stores, or equipment in such spaces.

(5) Cylinders shall have their valves protected at all times by one of the following methods:

(i) By metal caps securely attached to the cylinders and of sufficient strength to protect the valves from injury.

(ii) By having the valves recessed into the cylinders or otherwise protected so that they will not be subject to a blow if the cylinder is dropped on a flat surface.

(6) Portable tanks shall have their valves protected at all times by a housing in accordance with the requirements under which they were manufactured.

(7) Electrical circuits in such cargo spaces shall meet the requirements of § 111.60–40 in Subchapter J (Electrical Engineering) of this chapter. If the electrical circuit does not meet such requirements, it must be deenergized by a positive means and not reenergized until the cargo has been removed and the space has been tested and found free of flammable vapor.

(8) During the stowage of portable cylinders or portable tanks in a hold or compartment, that is not fitted with electrical fixtures meeting the requirements of § 111.60–40, no means of artificial lighting shall be used within the space unless such equipment is of the explosion-proof type. Electrical connections for portable lights shall be made from outlets on the weather deck. Hand flashlights used in the stowage area shall be of an approved type.

(9) The following dangerous cargoes shall not be stowed in the same hold or compartment with liquefied flammable gas containers:

(i) Class A, B, or C explosives.
(ii) Flammable solids.
(iii) Oxidizing materials.
(iv) Corrosive liquids.
(v) Poisonous articles.
(vi) Cotton and similar fibrous materials.

(R.S. 4472, as amended, 4488, as amended, 46 U.S.C. 170, 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.01–5 Certificate of inspection—TB/ALL.

(a) The certificate of inspection shall be endorsed for the carriage of liquefied flammable gases as follows:

Inspected and approved for the carriage of liquefied flammable gases (1) at a pressure not to exceed _____ p.s.i., and (2) at temperatures not less than _____° F.

(b) Tanks approved to carry cargoes at below ambient temperatures shall have the applicable limiting temperatures indicated on the certificate. Tanks designed to carry cargoes only at ambient temperatures should have the word "ambient" entered in these spaces.

(R.S. 4421, as amended; 46 U.S.C. 399)

Subpart 38.05—Design and Installation

§ 38.05–1 Design and construction of vessels—general—TB/ALL.

(a) Vessels designed for the carriage of liquefied gases shall comply with the applicable requirements of this subchapter.

(b) Access and ventilation intakes to the machinery, accommodation and working spaces should be so arranged

as to prevent the flow of cargo vapor from the weather deck into such spaces. In this respect openings in the forward or after ends of poops, forecastles, and deckhouses adjacent the cargo area shall be at least 24 inches above the cargo handling deck.

(c) Materials used in the fabrication of cargo tanks and piping shall have adequate notch toughness at the service temperature. Where a secondary barrier is required, the material of that barrier and of contiguous hull structure shall have sufficient notch toughness at the lowest temperature which may result during the containment of leakage cargo within the secondary barrier. Materials used in the fabrication of the cargo containment and handling system shall satisfy the requirements for toughness specified by the Commandant.

(d) Cargo tank spaces are to be isolated from the remainder of the vessel by cofferdams in accordance with § 32.60–10 of this subchapter. In a nonpressure vessel configuration, the void between the primary and secondary barriers shall not be acceptable as the required cofferdams.

(e) Compartments containing cargo tanks or pipes shall be accessible from the weather deck only. No openings from these compartments to other parts of the vessel are permitted.

(f) Barges shall comply with the applicable sections of Subpart 32.63 of this subchapter.

(R.S. 4472, as amended, 4488, as amended, 46 U.S.C. 170, 481; Treasury Dept. Order 167–38, Oct. 26, 1950, 24 F.R. 8857)

§ 38.05–2 Design and construction of cargo tanks—general—TB/ALL.

(a) The maximum allowable temperature of the cargo is defined as the boiling temperature of the liquid at a pressure equal to the setting of the relief valve.

(b) The service temperature is the minimum temperature at which cargo is loaded and/or transported in the cargo tank. However, the service temperature shall in no case be taken higher than given by the following formula:

$$t_s = t_w - 0.25\,(t_w - t_b) \qquad (1)$$

where:

t_s = Service temperature.

t_w = Boiling temperature of gas at normal working pressure of tank but not higher than +32° F.

t_b = Boiling temperature of gas at atmospheric pressure.

(c) Heat transmission studies, where required, shall assume the minimum ambient temperatures of 0° F. still air and 32° F. still water, and maximum ambient temperatures of 115° F. still air and 90° F. still water.

(d) Cargo tanks in vessels in ocean; Great Lakes; lakes, bays, and sounds; or coastwise service shall be designed to withstand, simultaneously, the following dynamic loadings:

(1) Rolling 30° each side (120°) in 10 seconds.

(2) Pitching 6° half amplitude (24°) in 7 seconds.

(3) Heaving $L/80'$ half amplitude ($L/20'$) in 8 seconds.

(e) Cargo tanks on barges shall be designed in accordance with § 32.63–25 of this subchapter.

(f) Each liquefied flammable gas tank shall be provided with not less than a 15-inch by 23-inch or an 18-inch nominal diameter manhole fitted with a cover located above the maximum liquid level and as close to the top of the tank as possible. Where access trunks are fitted to the tanks, the nominal diameter of the trunks shall be not less than 30 inches.

(g) Cargo tanks vented above 10 pounds per square inch gage shall be of the pressure vessel type.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 38.05–3 Design and construction of pressure vessel type cargo tanks—TB/ALL.

(a) Cargo tanks of pressure vessel configuration (e.g., cylindrical, spherical, etc.) shall meet the requirements for Class I or Class II unfired pressure vessels, and shall be fabricated, inspected, and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter, except as otherwise provided for in this part.

(b) The requirements of this section anticipate that cargo tanks constructed as pressure vessels will, by themselves, constitute the cargo containment system and usually will not require a secondary barrier.

(c) In the design of the tank, consideration shall be given to the possibility of the tank being subjected to external loads. Consideration shall also be given to excessive loads that can be imposed on the tanks by their support due to static and dynamic forces under operating conditions or during testing. The design shall show the manner in which the tanks are to be installed, supported, and secured, and shall be approved prior to tank installation.

(d) Tanks with a service temperature of minus 20° F. or lower and fabricated of ferritic materials shall be stress relieved.

(e) Unlagged cargo tanks, where the cargo is transported, at or near ambient temperatures, shall be designed for the vapor pressure of the gas at 115° F. The design shall also be based on the minimum internal pressure (maximum vacuum), plus the maximum external static head to which the tank may be subjected. Whenever surrounding cargo is at a greater temperature than the maximum allowable temperature of the liquefied flammable gas tanks, the liquefied flammable gas cargo is to be such that the design pressure of the liquefied flammable gas tank is not exceeded.

(f) Where cargo tanks, in which the cargo is transported at or near ambient temperature, are lagged with an insulation material of a thickness to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree Fahrenheit differential in temperature per hour, the tanks shall be designed for a pressure of not less than the vapor pressure of the gas at 105° F. The insulation material shall conform to the requirements of § 38.05–20. The design shall also be based on the minimum internal pressure (maximum vacuum) plus the maximum external static head to which the tank may be subjected.

(g) Cargo tanks in which the temperature is maintained below the normal atmospheric temperature by refrigeration or other acceptable means, shall be designed for a pressure of not less than 110 percent of the vapor pressure corresponding to the temperature of the liquid at which the system is maintained, or the pressure corresponding to the greatest dynamic and static loads expected to be encountered either in service or during testing. For mechanically stress relieved cargo tanks, additional factors relating design pressure and maximum allowable pressure shall be as specified by the Commandant. The material of the tank shall be as approved by the Commandant for the service temperature and this temperature shall be permanently marked on the tank as prescribed in § 38.05–5.

(h) Where applicable, the design shall investigate the thermal stresses induced in the cargo tank at the service temperature.

(i) The shell and head thickness of liquefied gas cargo tanks shall not be less than five-sixteenths inch.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 38.05–4 Design and construction of nonpressure vessel type cargo tanks—TB/ALL.

(a) The requirements in this section anticipate a cargo containment system consisting of a primary tank which is structually self-supporting and, where required, a secondary barrier. Other vessel or cargo tank configurations, such as membrane type liners externally supported, will be considered upon submission of substantiating data, and based upon such additional tests as the Commandant may direct.

(b) A secondary barrier is an arrangement or structure designed to contain the cargo temporarily if leakage develops in the primary container. A secondary barrier shall be provided where leakage from the primary container may cause lowering of the temperature of the ship's structure to an unsafe level. The secondary barrier shall be constructed of material suitable to contain the cargo at the service temperature.

(c) The design of the cargo containment systems shall be such that under normal service conditions, or upon failure of the primary tank, the hull structure shall not be cooled down to a temperature which is unsafe for the materials involved. Structural members not suitable for the service temperatures of the cargo shall be protected by a secondary barrier consisting of suitable structural containment together with necessary associated insulation. Heat transmission studies and tests may be required to demonstrate that the arrangement is feasible and that the final material temperatures are acceptable.

(d) The design and construction of the cargo tanks shall be at least equivalent to the standards established by the

American Bureau of Shipping or other recognized classification society. For special tanks, or designs not contemplated by standards of the classification society, a detailed analysis of the entire tank, or designated parts thereof, shall be made and submitted to the Commandant for approval.

(e) The cargo tank shall be designed for a head of cargo at least equal to the highest level the liquid cargo may attain plus the maximum venting pressure. In no case shall a head of cargo less than 4 feet above the cargo hatch or expansion trunk be used.

(f) The design shall investigate the thermal stresses induced in the cargo tank during loading. Where necessary, devices for spray loading or other methods of precooling or cooling during loading shall be included in the design.

(g) All weld intersections or crossings in joints of primary tank shells shall be radiographed for a distance of 10 thicknesses from the intersection. All other welding in the primary tank and in the secondary barrier shall be spot radiographed in accordance with the requirements of § 56.05–6 of Subchapter F (Marine Engineering) of this chapter.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 38.05–5 Markings—TB/ALL.

(a) (1) Upon satisfactory completion of tests and inspection, the following marking, at least ⅜-inch high, shall be stamped into a noncorrodible nameplate permanently attached to the tank:

(Name and address of manufacturer)

---- p.s.i.

(Hydrostatic test pressure at 70° F. or above)

---- p.s.i.

(Maximum allowable pressure)

---- ° F. Service temperature

---- ----

(O.C.M.I. No.) (Initials and C.G. Symbol)

(Manufacturer's Serial No.)

(Date of manufacture)

(Water capacity, U.S. gallons)

(2) Hydrostatic test for pressure vessel type tanks shall be that specified in § 38.25–1(b). In the case of nonpressure vessel type tanks, the hydrostatic test pressure shall mean the pressure specified in § 38.25–1(d), while the maximum allowable pressure shall mean the maximum venting pressure as used in § 38.05–4(e). Where it is not feasible to attach the nameplate to the tank, it shall be conspicuously displayed nearby.

(b) All tank inlet and outlet connections, except safety relief valves, liquid level gaging devices, and pressure gages, shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of corrosion-resistant material may be attached to valves.

(c) All tank markings shall be permanently and legibly stamped in a readily visible position, and shall not be obscured by painting. If the tanks are lagged, the markings attached to the tank proper shall be duplicated on a corrosion-resistant plate secured to the outside jacket of the lagging.

§ 38.05–10 Installation of cargo tanks—general—TB/ALL.

(a) (1) Cargo tanks shall be supported on foundations of steel or other suitable material and securely anchored in place to prevent the tanks from shifting when subjected to external forces. Each tank shall be so supported as to prevent the concentration of excessive loads on the supporting portions of the shell or head as prescribed under § 38.05–2(d).

(2) Cargo tanks installed in barges shall comply with the requirements of § 32.63–25 of this subchapter.

(b) Foundations, and stays where required, shall be designed for support and constraint of the weight of the full tank, and the dynamic loads imposed thereon. Thermal movement shall also be considered.

(c) Foundations and stays which may be exposed to the cargo shall be suitable for the temperatures involved and be impervious to the cargo.

(d) The design of the foundations and stays shall consider the resonance of the cargo tank, or parts thereof, and the vibratory forces found in the tank vessel. If necessary, effective damping arrangements shall be provided.

(e) Independent containment systems shall be so arranged as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom to provide access for inspection of the hull. Clearances for collision protection, where required by other parts of the regulations in this subchapter, may increase the clearances specified here.

(f) For pressure vessel type tanks the distance between adjacent tanks and between tanks and vessel's structure shall be adequate to permit access for inspection and maintenance of all tank surfaces and hull structure as approved by the Commandant. Alternate provisions may be made for inspection and maintenance of the vessel's structure and tanks by moving such tanks or by providing equivalent acceptable means for remote inspection.

(2) For nonpressure vessel type containment systems, access shall be arranged to permit inspection of one side each of the primary tank and secondary barrier, under normal shipyard conditions. Containment systems which, because of their peculiar design, cannot be visually inspected to this degree, may be specially considered provided an equivalent degree of safety is attained.

(f) Cargo tanks may be installed "on deck," "under deck," or with the tanks protruding through the deck. All tanks shall be installed with the manhole openings located in the open above the weather deck. Provided an equivalent degree of safety is attained, the Commandant may approve cargo tanks installed with manhole openings located below the weather deck.

(g) For pressure vessel type cargo tanks, the following conditions apply:

(1) Liquefied flammable gas cargo tanks may be located in cargo tanks or in spaces which meet the requirements for cofferdams as defined in § 30.10–13 of this subchapter. When liquefied flammable gas cargo tanks are installed in cargo tanks, such cargo tanks may be used simultaneously or separately for the carriage of flammable or combustible liquids up to and including the grade for which the cargo tanks are otherwise certified in accordance with the requirements of this subchapter.

(2) Where the liquefied flammable gas tanks are installed in cargo tanks and a portion of the liquefied flammable gas tanks extend above the weather deck, the penetration shall be made gastight and watertight, and shall be such as to provide full compliance with the structural requirements including testing for the hull and integral tanks. In the application of the requirements for the hydrostatic test of the cargo tanks, the hydrostatic test shall in no case be less severe than the worst anticipated service condition of the cargo loading. In the design and testing of independent cargo tanks and integral cargo tanks consideration shall be given to the possibility of the independent tanks being subjected to external loads.

(3) Where the liquefied flammable gas tanks are installed in nontank hull spaces and a portion of the tank extends above the weather deck, provision shall be made to maintain the weathertightness of the deck, except that the weathertightness of the upper deck need not be maintained on:

(i) Vessels operating on restricted routes which are sufficiently protected; or,

(ii) Open hopper type barges of acceptable design.

(h) No strength welding employed in the attachment of supports, lugs, fittings, etc., shall be done on tanks that require and have been stress relieved, unless authorized by the Commandant.

(R.S. 4433, as amended, 4488, as amended; 46 U.S.C. 411, 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.05–20 Insulation—TB/ALL.

(a) Where used, tank insulation shall satisfy the following requirements for combustibility, installation, and arrangement:

(1) Insulation in a location exposed to possible high temperature or source of ignition shall be either:

(i) Incombustible, complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter; or,

(ii) Self-extinguishing, as determined by American Society for Testing and Materials Specification D–1692, "Flammability of Plastics, Foam and Sheeting," and covered by a suitable steel cover.

(2) Insulation in a location protected against possible ignition by enclosure in a tight steel envelope in which inert conditions are maintained need satisfy no requirement for combustibility except chemical stability.

(3) Insulation in a location protected against possible high temperature or source of ignition by continuous surrounding structural voids or ballast

tanks need satisfy no requirement for combustibility except chemical stability.

(b) All insulation shall be of a vapor-proof construction, or have a vapor-proof coating of a fire-retardant material acceptable to the Commandant. Unless the vapor barrier is inherently weather resistant, tanks exposed to the weather shall be fitted with a removable sheet metal jacket of not less than 0.083-inch thick over the vapor-proof coating and flashed around all openings so as to be weathertight. Weather resistant coatings shall have sheet metal over areas subject to mechanical damage.

(c) The insulation shall be adequately protected in areas of probable mechanical damage.

(d) Insulation which forms an integral part of the secondary barrier shall meet the following additional requirements:

(1) When the secondary barrier is called upon to contain the cargo, insulating material which is contacted shall not be affected by the cargo. Samples of the insulating material shall be tested in the cargo for solubility, absorption and shrinkage. The samples shall be checked for the above effects at intervals not exceeding 1 week, for a total test period of 6 weeks.

(2) Any adhesives, sealers, coatings, or vapor barrier compounds used in conjunction with the insulating material shall be similarly tested to insure suitable cargo resistive properties.

(3) The insulation shall have sufficient mechanical strength for the proposed design. Additionally, the thermal expansion of the insulation relative to the material to which it is affixed shall be considered in the design.

(e) The insulation for the piping systems shall be at least of the "self-extinguishing" type described in paragraph (a) of this section, and comply with the requirements contained in paragraphs (b) and (c) of this section.

§ 38.05–25 Refrigerated systems—TB/ALL.

(a) When a liquefied flammable gas is carried below atmospheric temperature under the requirements of § 38.05–3(f) or § 38.05–4, maintenance of the tank pressure below the maximum allowable pressure shall be provided by one or more of the following means:

(1) A refrigeration or liquefication system which regulates the pressure in the tanks. A standby compressor or equivalent equipment, of a capacity equal to one of the working units shall be provided.

(2) A system whereby the vapors are utilized as fuel for shipboard use.

(3) A system allowing the liquefied flammable gas to warm up and increase in pressure. The insulation and tank design pressure shall be adequate to provide for a suitable margin for the operating time and temperatures involved.

(4) Other systems acceptable to the Commandant.

(b) A system whereby the vapors are vented to the atmosphere at sea only may be employed in conjunction with paragraph (a)(1) of this section. The pressure control valves shall be independent of the safety relief valves. See § 38.20–1(j).

Subpart 38.10—Piping, Valves, Fittings, and Accessory Equipment

AUTHORITY NOTE: The provisions of this Subpart 38.10 also interpret or apply R.S. 4433, as amended, 4488, as amended; 46 U.S.C. 411, 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857.

§ 38.10–1 Valves, fittings, and accessories—TB/ALL.

(a) All valves, flanges, fittings, and accessory equipment for operation at atmospheric temperatures shall be of a type suitable for use with liquefied flammable gases, and shall be made of steel or Grade A malleable iron conforming to the requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter. When the cargo is carried at temperatures below atmospheric the valves, flanges, fittings, and accessory equipment shall be of a type and material suitable for use with liquefied flammable gas at the minimum temperature to which they may be subjected, and shall be subject to approval by the Commandant.

(b) All valves, flanges, fittings, and accessory equipment shall have a pressure rating at operating temperatures not less than the maximum allowable pressure to which they may be subjected. Piping which is not protected by a relief valve or which can be isolated from its relief valve by other valves shall be designed for the greatest of the cargo vapor pressure at 115° F., or the maximum allowable pressure of the cargo tank, or the requirements of § 38.10–10(a). Cargo liquid piping which may be subject to liquid full conditions shall be fitted with relief valves. The escape from piping systems relief valves shall be piped to a venting system or to a suitable vapor recovery system. Provision shall be made for the proper venting of all valves, fittings, etc., in which pressure buildup may occur, especially in refrigerated systems, because of an increase in product temperature.

(c) Welded connections shall be used wherever possible with the number of flanged joints kept to the minimum necessary for assembly and cleaning. Sockets in sizes 3 inches and smaller and slip-on flanges in sizes 4 inches and smaller may be used. Threaded joints may be used in sizes of 1 inch and smaller. Where threaded joints are used, they shall be visible and accessible for inspection under all service conditions, and limited to instrument and control lines properly valved from the main lines. Where threaded joints are sealed by brazing or welding, they need not be exposed.

(d) Valve seat material, packing, gaskets, etc., shall be resistant to the action of the liquefied flammable gas. All flange and manhole cover gaskets shall be compressed asbestos, spiral-wound metal asbestos, metal jacketed asbestos, solid aluminum, corrugated steel, solid steel, or iron, or other materials with equal or better resistance to fire exposure.

(e) Provisions shall be made by the use of offsets, loops, bands, expansion joints, etc., to protect the piping and tank from excessive stress due to thermal movement and/or movements of the tank and hull structure. Expansion joints shall be held to a minimum and where used shall be of the bellows type and subject to special approval by the Commandant.

(f) Low temperature piping shall be thermally isolated from the hull structure. Arrangements should provide for the protection of the hull structure from leaks in way of pumps, flanges, joints, etc.

(g) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valve connections, refrigeration connections where necessary, liquid level gaging devices, thermometer well and pressure gage, and shall be provided with suitable access for convenient operation. Piping shall enter the cargo tanks above weather deck and as close to the top of the tank or dome as possible, except as otherwise permitted in this section. Connections to the tanks shall be protected against mechanical damage and tampering. No underdeck cargo piping shall be installed between the outboard side of the cargo containment system and the shell of the vessel, unless provision is made to maintain the minimum inspection and collision protection clearances of § 38.05–10(e) between the piping and the shell. Other openings in the tanks, except as specifically permitted by the Commandant, are prohibited.

(h) Cargo loading and discharge piping may be connected to the tanks below the weather deck or below the liquid level subject to approval by the Commandant, provided:

(1) A remotely controlled quick-closing shutoff valve is flanged to the tank outlet connection. The control mechanism for this valve shall meet the requirements of § 38.10–5.

(2) The piping which is below the weather deck or liquid level shall be joined by welding except for a flanged connection to the quick-closing shutoff valve and a flanged connection to the cargo pump.

(3) The design and arrangement of this piping, including the flange bolting shall be such that excessive stresses will not be transmitted to the cargo tank outlet connection or the quick-closing valve, even in the event of abnormal displacement of the piping.

(4) Except for those vessels, the design of which permits the exclusion of a weathertight deck over the tanks, the space in which such piping is located shall be accessible only from the weather deck and shall be vented to a safe location above the weather deck.

(i) All connections to tanks, except safety relief valves and liquid level gaging devices, shall have manually operated shutoff valves located as close to the tank as possible. In addition, all liquid and vapor connections on pressure vessel type tanks except safety relief valves, liquid level gaging devices, and filling and discharge lines, shall be equipped with either an automatic excess

flow valve or a remotely controlled quick-closing shutoff valve of the fail closed type. These valves, except when necessary for the operation of the system, shall remain closed. For pressure vessel type tanks operating at low pressure and with service temperature near the cargo atmospheric boiling point, the Commandant may approve individual installations where the liquid and vapor connections normally requiring automatic excess flow valves or remotely controlled quick-closing shutoff valves are fitted with manually operated shutoff valves only.

(j) The control system for quick-closing shutoff valves shall be provided with a remote control in at least two locations and be of a type acceptable to the Commandant. The control system shall also be provided with a fusible element designed to melt between 208° F. and 220° F., which will cause the quick-closing shutoff valves to close in case of fire. The quick-closing shutoff valves shall be capable of local manual operation.

(k) Excess flow valves, where required by this subchapter shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings, and appurtenances protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve.

(l) Liquid level gaging devices which are so constructed that outward flow of tank contents shall not exceed that passed by a No. 54 drill size (0.055-inch diameter) opening, need not be equipped with excess flow valves.

(m) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size (0.055-inch diameter).

(n) Excess flow valves may be designed with a bypass not to exceed a No. 60 drill size (0.040-inch diameter) opening to allow equalization of pressure.

(o) Suitable valves shall be installed on the cargo headers to relieve the pressure in the liquid and vapor lines to a safe location prior to disconnecting shore lines.

(p) A pressure gage shall be located at the highest practicable point. A thermometer well where installed on the tank proper shall be attached to the tank by welding.

(q) For nonpressure vessel type tanks, the following additional fittings are required:

(1) A liquid level gaging device shall be provided to determine the level of the liquid cargo without opening the tank. The gage shall be readable from the open deck, or from a control room or station when the loading or discharging is controlled from such a room or station. Tables shall be readily available for direct determination of volume of liquid in the tanks, with necessary corrections for trim, temperature, and density.

(2) An independent high level alarm shall be provided for each tank. The alarm indication shall register at the station where loading is controlled.

(3) Each tank shall be provided with remote reading temperature sensors located near both the cargo liquid level and the bottom of the tank. The temperature shall be read at the control station for loading and unloading cargo, if provided, otherwise near the cargo control valves.

(4) Each tank shall be fitted with a pressure and a vacuum gage which shall be read at the control station for loading and unloading cargo, if provided, otherwise near the cargo control valves. In addition, the liquid loading and discharge headers at the ship's shore connection station shall be fitted with pressure gages.

(r) Spaces surrounding cargo tanks shall be provided with suitable means for pumping out.

(1) Where pressure vessel type tanks are installed or in other cases where no secondary containment is required, this may consist of a bilge system independent of the bilge system for the rest of the vessel, and having no pipe connections between the cargo tank spaces and the engineroom or boilerroom, except that eductors may be supplied from engineroom pumps.

(2) Secondary containment spaces of structurally self-supporting tanks shall be provided with suitable means for pumping out leaked cargo. These should be arranged so as to provide the following alternatives:

(i) Return of the cargo to the same primary tank or other tank.

(ii) Pumping the cargo off the ship either in port through a regular shore unloading connection or at sea overboard in a safe manner.

§ 38.10–5 Filling and discharge pipes—TB/ALL.

(a) Filling and discharge connections shall be provided with the manually operated valve required by § 38.10–1(i) and with a positive acting remote controlled quick-closing valve. The remote controlled quick-closing valve shall satisfy the requirements of § 38.10–1(j).

(b) For pressure vessel type tanks the remote controlled quick-closing valves shall be located on the inside of the tank or on the outside where the piping enters the tank. For pressure vessel type tanks operating at low pressure and with service temperature near the cargo atmospheric boiling point, the Commandant may approve individual installations where these valves are located at the loading and discharge headers.

(c) For nonpressure vessel type tanks the remote controlled quick-closing valves may be located at the loading and discharge headers.

§ 38.10–10 Cargo piping—TB/ALL.

(a) The piping shall be designed for a working pressure of not less than the maximum pressure to which it may be subjected but in no case less than the design pressure of the cargo tanks. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall not be less than the pump or compressor discharge relief valve setting; or, provided the piping is not protected by relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(b) Piping subject to tank pressure shall be seamless drawn steel or electric resistance welded steel. Pipe used in refrigerated tank systems shall be made of a material which is suitable for the minimum temperature to which it may be subjected and acceptable to the Commandant.

NOTE: Present U.S. Coast Guard requirements are that design temperature for materials considered to be suitable is 10° F. below the service temperature of the system.

(c) Piping shall be provided with adequate support to take the weight of the piping off valves and fittings and to prevent excessive vibration and stresses on tank connections.

(d) For nonpressure vessel type tanks, the cargo handling arrangements and piping shall provide for emptying of a damaged tank, including cargo contained by a secondary barrier.

§ 38.10–15 Safety relief valves for pressure vessel type tanks—TB/ALL.

(a) Each tank shall be fitted with or (subject to approval by the Commandant) connected to one or more safety relief valves designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall be set to start to discharge at a pressure not in excess of the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the design pressure of the tank. The minimum rates of discharge of safety relief values shall not be less than that determined by the following formula:

$$Q=633{,}000\ \frac{FA^{0.82}}{LC}\sqrt{\frac{ZT}{M}} \qquad (1)$$

or

$$Q=FGA^{0.82} \qquad (2)$$

where:

Q = Minimum required rate of discharge in cubic feet per minute of air at standard conditions (60° F. and 14.7 p.s.i.a.).

F = Fire exposure factor.

F = 1.0 for noninsulated pressure vessel type tanks.

F = 0.5 for pressure vessel type tanks insulated with approved fireproofing material. This fire exposure factor may be used with approval of the Commandant, based on the thermal conductance of the insulation and its stability under fire exposure.

F = 0.2 for independent nonpressure vessel type tanks in holds which are not maintained inerted.

F = 0.1 for independent nonpressure vessel type tanks in inerted holds, and for membrane type tanks.

M = Molecular weight of the cargo.

T = Temperature, degrees R(460+temperature in degrees F. of gas at relieving conditions).

A = Total surface area of the cargo tank in square feet which may be subjected to fire exposure. For nonpressure vessel type cargo tanks, A=entire surface area, less the bottom.

$A = \pi X\ D(U+0.3D)$, for cylindrical tanks with spherically dished or semiellipsoidal heads.
$A = \pi X\ (D\ X\ U)$ for cylindrical tanks with hemispherical heads.
$A = \pi X\ D^2$, for spherical tanks.
D = Outside diameter of the tank, in feet.
U = External overall length of the tank, in feet.
C = Constant based on the relation of the specific heats. See ASME "Unfired Pressure Vessel Code", Section 8, Appendix J, which may be purchased from American Society of Mechanical Engineers, 345 East 47th Street, New York, N.Y. 10036. (If K is not known, use C=315.)
L = Latent heat of the material being vaporized at relieving conditions, in B.t.u. per pound.
Z = Compressibility factor of the gas at relieving conditions (if not known, use Z=1.0).
G = Constant for individual gas. Typical values for propane are given in Table 38.10-15(c)(1).

TABLE 38.10-15(c)(1)—TYPICAL VALUES FOR COMMERCIAL PROPANE

Relief valve setting, pounds per square inch gage	"G" constant for relieving conditions at 120 percent of relief valve setting
250	53.6
90	40.3
65	38.6

(d) Safety relief valve connections shall be attached to the tank near the highest point of the vapor space. Shutoff valves shall not be installed between the tanks and safety relief valves, except manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking shutoff valves so arranged at all times as to permit the required capacity discharge through the open safety relief valves.

(e) Each safety relief valve shall be tested in the presence of a marine inspector before being placed in service. The tests shall satisfactorily indicate that the safety relief valves will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank.

§ 38.10-16 Safety relief valves for nonpressure vessel type tanks—TB/ALL.

(a) Safety relief valves of both the pressure and vacuum type shall be designed, constructed, and flow tested in accordance with Subpart 162.017 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall be set to start to discharge at a pressure not in excess of the design pressure of the tank.

(c) One or more safety relief valves shall be fitted to the highest point of each tank. Normally no intervening valves are permitted between the tank and the relieving devices. However, a duplicate set of relief valves, with interlocking devices, may be used.

(d) The safety relief valves shall have a combined relieving capacity to discharge the greater of the following, with not more than 20 percent rise in pressure (in the tank) above the maximum allowable pressure:

(1) The vapors evaporated by an ambient air temperature of 115° F. plus the maximum flow rate of the cargo filling pipes; or,

(2) The vapors generated under fire exposure, computed using the formulas of § 38.10-15(c).

(e) Means shall be provided to protect the tanks from excessive external pressure.

(f) Void spaces between the primary and secondary barriers shall be protected by relief devices. The relief device setting shall not be higher than the void test pressure, and shall not exceed 90 percent of the setting of the safety relief valve protecting the primary tank.

§ 38.10-20 Liquid level gaging devices—TB/ALL.

(a) Each tank shall be fitted with a liquid level gaging device of approved design to indicate the maximum level to which the tank may be filled with liquid:

(1) between −20° F. and 130° F. for unrefrigerated service; or,

(2) Within the operating temperature range for tanks operating below atmospheric temperature.

(b) Liquid level gaging devices may be of the following types: Rotary tube, slip tube, magnetic, automatic float, or similar types approved by the Commandant. Except as otherwise provided in this section, fixed tube devices are not acceptable as the primary gaging device.

(c) All gaging devices shall be arranged so that the maximum liquid level for product being carried, to which the tank may be filled is readily determinable. The maximum gallonage capacity as required by § 38.15-1 shall be:

(1) Marked on the tank system nameplate or gaging device; or,

(2) Shown in the ullage tables.

(d) Gaging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size (0.055-inch diameter), unless provided with an excess flow valve.

(e) For pressure vessel type tanks each automatic float, continuous reading tape or similar type gage not mounted directly on the tank or dome shall be fitted with a shutoff device located as close to the tank as practicable. When an automatic float gaging device, which gages the entire height of the tank is used, a fixed tube gage set in the range of 85 percent to 90 percent of the water capacity of the tank shall be provided in addition as a means of checking the accuracy of the automatic float gage, or other alternate means acceptable to the Commandant may be used.

(f) A gaging device shall be designed for a pressure at least equal to the maximum allowable pressure of the tank on which it is installed.

(g) Gage glasses of the columnar type are prohibited.

(h) Flat sight glasses may be used in the design of automatic float continuous reading tape gages: *Provided*, That such glasses shall be made of high strength material suitable for the operating temperatures of not less than one-half inch in thickness and adequately protected by a metal cover.

Subpart 38.15—Special Requirements

§ 38.15-1 Filling of tanks—TB/ALL.

(a) Refrigerated and semirefrigerated tanks shall be filled so that there is an outage of at least 2 percent of the volume of the tank at the temperature corresponding to the vapor pressure of the cargo at the safety relief valve setting. A reduction in the required outage may be permitted by the Commandant when warranted by special design considerations. Normally then, the maximum volume to which a tank may be loaded is:

$$V_L = \frac{0.98 d_r V}{d_L} \qquad (1)$$

where:

V_L = maximum volume to which tank may be loaded.
V = Volume of tank.
d_r = density of cargo at the temperature required for a cargo vapor pressure equal to the relief valve setting.
d_L = density of cargo at the loading temperature and pressure.

(b) Nonrefrigerated tanks shall be filled so that their filling densities shall not exceed the ratios indicated in Table 38.15-1(b).

TABLE 38.15-1(b)—MAXIMUM PERMISSIBLE FILLING DENSITIES FOR TANKS OPERATING AT OR NEAR AMBIENT TEMPERATURE

Specific gravity at 60° F.	Maximum permitted filling density		
	Unlagged tanks—water capacity		Lagged tanks—all capacities
	1,200 gal. and under	Over 1,200 gal.	
0.473–0.480	38	41	42
0.481–0.488	39	42	43
0.489–0.495	40	43	44
0.496–0.503	41	44	45
0.504–0.510	42	45	46
0.511–0.519	43	46	47
0.520–0.527	44	47	48
0.528–0.536	45	48	49
0.537–0.544	46	49	50
0.545–0.552	47	50	51
0.553–0.560	48	51	52
0.561–0.568	49	52	53
0.569–0.576	50	53	54
0.577–0.584	51	54	55
0.585–0.592	52	55	56
0.593–0.600	53	56	57
0.601–0.608	54	57	58
0.609–0.617	55	58	59
0.618–0.626	56	59	60
0.627–0.634	57	60	61

NOTE: Increase in filling densities to provide for seasonal changes may be considered by the Commandant upon presentation of factual evidence that safe operation can be effected.

(c) The "filling density" is defined as the percent ratio of the weight of the gas in a tank to the weight of water the tank will hold at 60° F.

§ 38.15-5 Cargo hose—TB/ALL.

(a) When the liquid and vapor line hoses used for loading and discharging the cargo are carried on board the vessel, they shall be of flexible metal and fabricated of seamless steel pipe and flexible joints of steel or bronze, or of other suit-

able material resistant to the action of the cargo. Hose used in refrigerated systems shall be suitable for the minimum temperature to which it may be subjected and shall be acceptable to the Commandant.

(b) Hose subject to tank pressure, or the discharge pressure of pumps or vapor compressors, shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank, pump, or compressor.

(c) Before being placed in service each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by its manufacturer to a pressure not less than twice its maximum working pressure nor more than two-fifth its bursting pressure. The hose shall be marked with its maximum working pressure, and if used in refrigerated service, its minimum temperature.

(R.S. 4488, as amended; 46 U.S.C. 481; Treasury Dept. Order 167-38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.15-10 Leak detection systems—T/ALL.

(a) A detection system shall be permanently installed to sense cargo leaks. The detectors shall be located within the space so as to permit the sensing of an initial leak and prevent an undetected gas accumulation. The sensitivity shall be in accordance with paragraph (b) of this section. The detectors shall be fitted in the following compartments:

(1) All spaces containing tanks, pipes, etc. excluding tanks and holds with pressure vessel type tanks therein and no piping.

(2) Pump and compressor rooms.

(3) Other spaces where gas concentrations might be expected.

(4) For nonpressure vessel type tanks, the space between the primary and secondary barriers.

(b) The indicating instruments for the detection system shall be located on the bridge or at the cargo control station. An audio and visual warning shall be given before any gas concentration reaches 30 percent of the lower explosive limit. The alarm shall indicate both on the bridge and at the cargo control station. Sampling of each detector shall be at least once every half hour.

(c) Means shall be provided to measure the full range of cargo gas concentration in the spaces.

§ 38.15-15 Electrical installations—TB/ALL.

(a) All electrical installations shall comply with the requirements contained in this subchapter and in Subchapter J (Electrical Engineering) of this chapter for tank vessels, except as otherwise specified in this part.

(b) Spaces containing cargo pumps, compressors, and piping are considered as equivalent to a tank vessel pumproom, and no electrical devices, except Coast Guard approved intrinsically safe devices, shall be installed in these spaces. Electric motors shall be segregated from these spaces by a gastight bulkhead. Electric lighting of the explosion-proof type may be installed in these spaces provided all switching is done from outside the space.

(c) All cargo tanks, piping, valves, etc., shall be effectively grounded to the vessel's hull. Tanks with an insulated inner shell (primary barrier) shall have an effective grounding bond to the outer shell (secondary barrier) or to the vessel's hull.

(d) Electric submerged motor cargo pumps may be used, when in compliance with the following requirements and subject to approval by the Commandant.

(1) Design details of the submerged motor pump, with an evaluation of the cooling efficiency of the product being pumped, shall be submitted.

(2) Provisions shall be made to exclude air from the tanks containing cargo in either vapor or liquid phase. The pump motor shall be deenergized when this condition is not satisfied.

(3) A liquid level sensing device shall automatically shut down the motor and sound an alarm at a predetermined low liquid level. The alarm location may be the station from which cargo handling is controlled or such other location outside the cargo area as is acceptable to the Commandant.

(4) Details of the power cable, tank penetrations and pump connections shall be submitted.

(5) An auxiliary means of emptying the cargo tanks shall be provided in accordance with § 38.10-10(d).

(6) Means for positively disconnecting the power supply between the switchboard and the pump power panel shall be provided, i.e., disconnect links, lockable breakers, etc.

(7) All materials used in the fabrication of the submerged motor cargo pumps shall be suitable for use with the liquid cargo at the design pressures and temperatures.

§ 38.15-20 Remote shutdowns—TB/ALL.

(a) All machinery associated with cargo loading, unloading, or cooling shall be capable of being shut down from a remote location. This location may be the station from which the cargo handling is controlled or such other location outside the cargo area as is acceptable to the Commandant.

Subpart 38.20—Venting and Ventilation

§ 38.20-1 Venting—T/ALL.

(a) Each safety relief valve installed on a cargo tank shall be connected to a branch vent of a venting system which shall be constructed so that the discharge of gas will be directed vertically upward to a point which shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and to a minimum of at least 10 feet, and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of vapor ignition. When special conditions will prevent the vent line header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height of one-third the beam of the vessel.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided for in the Table 38.20-1(b), and upon the total safety relief valve discharge capacity.

TABLE 38.20-1(b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks:	*Percent of total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting. In nonpressure vessel vent systems, however, where the maximum back pressure of 10 percent of the relief valve setting is insufficient to move the gases through any but an extremely large diameter vent pipe, the back pressure may exceed 10 percent provided:

(1) The pressure in the tank during venting does not exceed 120 percent of the tank maximum allowable pressure; and,

(2) The safety relief valve is sized to discharge the required capacity with the tank pressure and vent back pressure actually used.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical injury and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow.

(g) No valve of any type shall be fitted in the vent pipe between the safety relief valve and the vent outlets.

(h) Provisions shall be made to drain condensate from the vent header piping. Special precautions shall insure that condensate does not accumulate at or near the relief valves.

(i) Relief valves discharging liquid cargo shall not be connected to the branch vent or vent header lines from the cargo tanks. They may, however, be connected to an accumulator, the vapor space of which, may in turn, be connected to the vent header system. Relief valves in the cargo piping system may discharge back to the cargo tanks.

(j) Vapor discharged to the atmosphere in accordance with § 38.05-25(b) shall utilize valves separate from the safety relief valves.

§ 38.20-5 Venting—B/ALL.

(a) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a reasonable height above the deck. An

alternate arrangement consisting of a branch vent header system as required by § 38.20–1 may be installed. In any case, the provisions of § 38.20–1 (d) through (j) shall apply.

(b) Arrangements providing for venting cargo tanks at sea on unmanned barges will be considered by the Commandant upon presentation of plans.

§ 38.20–10 Ventilation—T/ALL.

(a) A power ventilation system shall be provided for compartments containing pumps, compressors, pipes, control spaces, etc. connected with the cargo handling facilities. These compartments shall be ventilated in such a way as to remove vapors from points near the floor level or bilges, or other areas where vapor concentrations may be expected. The compartments shall be equipped with power ventilation of the exhaust type having capacity sufficient to effect a complete change of air in not more than 3 minutes equal to the volume of the compartment and associated trunks.

(b) The power ventilation units shall not produce a source of vapor ignition in either the compartment or the ventilation system associated with the compartment. Inlets to exhaust ducts shall be provided and located at points where concentrations of vapors may be expected. Ventilation from the weather deck shall be provided. Ventilation outlets shall terminate away from any openings to the interior part of the vessel a lateral distance at least equal to that specified in § 38.20–1(a). These outlets shall be so located as to minimize the possibility of recirculating contaminated air through the compartment.

(c) Means shall be provided for purging the following spaces of cargo vapors:

(1) The space surrounding nonpressure vessel type tanks, i.e., within the secondary barrier.

(2) The space surrounding pressure vessel type tanks whose piping connections are below the weather deck in accordance with § 38.10–1(h).

(3) The space surrounding tanks whose manhole openings are below the weather deck in accordance with § 38.05–10(f).

Subpart 38.25—Periodic Tests and Inspections

§ 38.25–1 Tests and inspections—TB/ALL.

(a) Each tank shall be subjected to the tests and inspections described in this section in the presence of a marine inspector, except as otherwise provided in this part.

(1) An internal examination shall be made at least once in each 8 calendar years.

(2) An external examination of unlagged tanks and the visible parts of lagged tanks shall be made at each inspection for certification and at such other times as considered necessary.

(3) To the extent, and if, deemed necessary by the marine inspector sufficient insulation shall be removed from insulated tanks at least once in each 8 calendar years to permit spot external examination of the tanks and insulation. The marine inspector may require that the thickness of the tanks be gaged by an acceptable nondestructive means without additional removal of insulation.

(b) A hydrostatic test of 1½ times the maximum allowable pressure, as determined by the safety relief valve setting, shall be made at any time that the marine inspector considers such hydrostatic test necessary to determine the condition of the tank. In the case of cargo tanks operating at maximum allowable pressures reduced below the design pressure in order to satisfy special mechanical stress relief requirements, the hydrostatic test pressure shall be 1½ times the maximum allowable pressure times the factor (due to mechanical stress relief) of design pressure divided by maximum allowable pressure.

(c) For pressure vessels designed and/or supported such that they cannot safely be filled with water, the Commandant will consider a pneumatic test in lieu of the hydrostatic test. A leak test, shall be performed in conjunction with the pneumatic test. Pneumatic testing shall be in accordance with Subchapter F (Marine Engineering) of this chapter.

(d) Nonpressure vessel type tanks shall be tested to a pressure equal to the pressure on the bottom of the tank under the design conditions listed in § 38.05–4(e).

(e) In the application of the requirements for testing of the cargo tanks, the test shall in no case be less severe than the worst anticipated service condition of the cargo loading.

(f) In the design and testing of the independent cargo tanks, consideration shall be given to the possibility of the independent tanks being subjected to external loads.

§ 38.25–5 Removal of defective tanks—TB/ALL.

If a tank fails to pass the tests prescribed in this subpart, it shall be removed from service unless otherwise authorized by the Commandant.

§ 38.25–10 Safety relief valves—TB/ALL.

(a) The cargo tank safety relief valves shall be inspected at least once in every 2 years.

(b) The safety relief valve discs shall be lifted from their seats in the presence of a marine inspector by either liquid, gas, or vapor pressure at least once every 4 years to determine the accuracy of adjustment and, if necessary, shall be reset.

PART 40—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISIONS FOR CARRYING CERTAIN FLAMMABLE OR COMBUSTIBLE DANGEROUS CARGOES IN BULK

Subpart 40.01—Application

1. Section 40.01–5 is amended to read as follows:

§ 40.01–5 Effective dates—TB/ALL.

(a) The provisions in Subpart 40.05 of this part shall be in effect on and after January 1, 1964.

(b) The provisions in Subpart 40.10 of this part shall be in effect on and after January 1, 1967.

Subpart 40.05—Ethylene Oxide

§ 40.05–69 [Amended]

2. Section 40.05–69 *Venting—TB/ALL* is amended in paragraph (b) by changing the number for the Table from "40.09–69(b)" to "40.05–69(b)".

3. Part 40 is amended by adding after § 40.05–87 a new Subpart 40.10, consisting of §§ 40.10–1 to 40.10–87, inclusive, reading as follows:

Subpart 40.10—Propylene Oxide

Sec.

40.10–1 General—TB/ALL.
40.10–2 Tank vessel certification and other cargoes—TB/ALL.
40.10–5 How propylene oxide may be carried—TB/ALL.
40.10–10 Design, construction, and arrangement of pressure-vessel type cargo tanks—TB/ALL.
40.10–20 Installation of cargo tanks—TB/ALL.
40.10–40 Valves, fittings, and accessories—TB/ALL.
40.10–45 Liquid level gaging device—TB/ALL.
40.10–50 Filling and discharge pipes—TB/ALL.
40.10–55 Cargo piping—TB/ALL.
40.10–60 Safety relief valves—TB/ALL.
40.10–65 Filling density—TB/ALL.
40.10–69 Venting—TB/ALL.
40.10–73 Ventilation—TB/ALL.
40.10–75 Cargo hose—TB/ALL.
40.10–80 Electrical bonding—TB/ALL.
40.10–83 Special cargo handling requirements—TB/ALL.
40.10–85 Warning signs and information cards—TB/ALL.
40.10–87 Tests and inspection—TB/ALL.

AUTHORITY: The provisions of this Subpart 40.10 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

§ 40.10–1 General—TB/ALL.

(a) Propylene oxide transported under the provisions of this subpart shall be acetylene free.

(b) Propylene oxide may be carried in tank barges or tankships in accordance with the provisions of this subpart.

(c) No other product may be transported in tanks certified for propylene oxide except that the Commandant may approve subsequent transportation of other products and return to propylene oxide service in tanks, piping and auxiliary equipment are adequately cleaned to the satisfaction of the marine inspector.

§ 40.10–2 Tank vessel certification and other cargoes—TB/ALL.

(a) The certificate of inspection shall be endorsed as follows:

Inspected and approved for the carriage of propylene oxide in tank number(s) ------.

(b) Unless authorized by the Commandant, no other kind of cargo except methane, ethane, propane, butane and pentane shall be on board a tank vessel certificated for the carriage of propylene

oxide at the same time propylene oxide in either the liquid or vapor state is present in any cargo tank. Propylene oxide tanks shall not be installed in tanks intended for any other cargo.

(R.S. 4421, as amended, 4472, as amended; 46 U.S.C. 390, 170)

§ 40.10–5 How propylene oxide may be carried—TB/ALL.

(a) Propylene oxide shall be carried in fixed, independent pressure-vessel type cargo tanks except as otherwise provided in paragraph (b) of this section.

(b) The Commandant may permit the transportation of propylene oxide in other than pressure-vessel type cargo tanks if it is shown to his satisfaction that the proposed method of transportation affords a degree of safety consistent with the minimum requirements of this subpart.

(R.S. 4488, as amended; 46 U.S.C. 481, Treasury Dept. Order 167–38, Oct. 26, 1950, 24 F.R. 8857)

§ 40.10–10 Design, construction, and arrangement of pressure-vessel type cargo tanks—TB/ALL.

(a) All cargo tanks shall be constructed of a carbon steel or stainless steel acceptable to the Commandant. Impurities of copper and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all steel used shall be submitted to the Commandant for approval prior to fabrication. Copper and other acetylide forming metals, such as silver, mercury, and their alloys, shall not be used as materials of construction for tanks or equipment used in handling propylene oxide.

(b) Cargo shall be transported in cylindrical pressure-vessel tanks which are independent of the vessel's hull structure. Adequate clearance shall be provided for the inspection and maintenance of the tanks, or such tanks shall be made movable.

(c) Cargo tanks shall meet the requirements of Class II arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(d) Cargo tanks shall be designed for the maximum pressure expected to be encountered during loading, storing and discharging the cargo but in no case shall the design pressure of such tanks be less than thirty (30) pounds per square inch gage. The tank shell and heads shall not be less than 5/16 inch thick. The design of tanks shall take into account the expected stresses due to internal pressure, static head and localized stress concentration.

(e) Each tank shall be provided with not less than one 15 x 23-inch elliptical or 18-inch diameter manhole located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to the tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4423, as amended; 46 U.S.C. 411)

§ 40.10–20 Installation of cargo tanks—TB/ALL.

(a) Cargo tanks shall be located below deck in holds or enclosed spaces with the domes or trunks extended above the weather deck and terminating in the open. Provisions shall be made to maintain the watertightness of the deck by means of watertight seals around such domes or trucks. The holds or enclosed spaces, in which the propylene oxide tanks are located, shall not be used for any other purpose. The weathertightness of the weather deck may not be required to be fully maintained on:

(1) Tankships operating on restricted routes which are sufficiently protected; or

(2) Open hopper type barges designed in accordance with criteria set forth in Subpart 32.63 of this subchapter.

(b) All cargo tanks shall be installed with the manhole openings and all tank connections located above the weather deck in the open.

(c) Tanks shall be mounted on suitable supports, be anchored in place, and electrically bonded to the hull. Each tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the tank shell. Collision chocks shall be installed to prevent any longitudinal shifting of and damage to the cargo tanks in the event of collision. The design shall show the manner in which the tanks are to be installed, supported, and secured in the barge or vessel and shall be approved prior to the installation of the tanks. Tanks on barges shall comply with the applicable sections of Subpart 32.63 of this subchapter.

(d) No welding of any kind shall be done on cargo tanks or supporting structure unless authorized by the Officer in Charge, Marine Inspection.

§ 40.10–40 Valves, fittings, and accessories—TB/ALL.

(a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with propylene oxide and shall be made of steel or stainless steel, or other materials acceptable to the Commandant. Impurities of copper and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all material used shall be submitted to the Commandant for approval prior to fabrication. Disc or disc faces, seats, and other wearing parts of valves shall be made of stainless steel containing not less than 11 percent chromium. Mercury, silver, copper and their alloys shall not be used for any valves, gages, thermometers, etc. Gaskets shall be constructed of spirally wound stainless steel with "Teflon" or other suitable material. All packing and gaskets shall be constructed of materials which do not react spontaneously with or lower the autoignition temperature of propylene oxide.

(b) The pressure rating of valves, fittings, and accessories shall be not less than the maximum pressure for which the cargo tank is designed or the shutoff head of the cargo pump, whichever is greater, but in no case less than 150 pounds per square inch, American Standards Association's standards. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Threaded joints in the cargo liquid and vapor lines are prohibited.

(c) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, which shall be accessible for convenient operation. All connections to tanks shall be made above the weather deck in the open to a trunk or dome and shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited unless specifically authorized by the Commandant.

(d) All connections to tanks, except safety relief valves and liquid level gaging devices shall have manually operated shutoff valves located as close to the tank as possible. In addition, all liquid and vapor connections on pressure vessel type tanks except safety relief valves, liquid level gaging devices, and filling and discharge lines, shall be equipped with either an automatic excess flow valve or a remotely controlled quick-closing shutoff valve of the fail closed type. These valves, except when necessary for the operation of the system, shall remain closed.

(e) The control system for quick-closing shutoff valves shall be provided with a remote control in at least two locations and be of a type acceptable to the Commandant. The control system shall also be provided with a fusible element designed to melt between 208° F. and 220° F., which will cause the quick-closing shutoff valves to close in case of fire. The quick-closing shutoff valves shall be capable of local manual operation.

(f) Excess flow valves, where installed, shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, valves, fittings and appurtenances protected by the excess flow valves, shall have a greater flow capacity than the rated flow of the excess flow valve.

(g) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size (0.055 inch diameter).

(h) Excess flow valves may be designed with a bypass not to exceed a No. 60 drill size (0.040 inch diameter) opening, to allow equalization of pressure.

(i) Relief valves shall be fitted in liquid lines which may be subject to excessive pressure due to thermal expansion when the lines are liquid full. The escape from these relief valves shall be piped to the venting system.

(j) The pressure gage connection shall be located at the highest practical point in the vapor space of the tank.

(k) The thermometer well shall terminate in the liquid space and shall be attached to the shell by welding with the end of the fitting being provided with a gastight screwed plug or bolted cover.

(R.S. 4423, as amended, 4488, as amended; 46 U.S.C. 411, 481; Treasury Dept. Order 167-38, Oct. 26, 1950, 24 F.R. 8857)

§ 40.10-45 Liquid level gaging device—TB/ALL.

(a) Each tank shall be fitted with a liquid level gaging device of approved design to indicate the level to which the tank may be filled.

(b) Liquid level gaging devices may be the slip tube, magnetic, automatic float, differential pressure, or other types approved by the Commandant.

(c) Any gaging device that requires bleeding of the product to the atmosphere, such as the slip tube, shall be so designed, that the bleed valve maximum opening is not larger than a No. 54 drill size (0.055 inch diameter), unless provided with an excess flow valve.

(d) The automatic float continuous reading tape gage, and similar types, shall be fitted with a shutoff valve located as close to the tank as practicable, which shall be designed to close from a remote position in the event of fracture of the external gage piping. An auxiliary gaging device shall always be used in conjunction with an automatic gaging device. This auxiliary device may be a duplication of the automatic device.

§ 40.10-50 Filling and discharge pipes—TB/ALL.

(a) Filling piping shall extend to within 4 inches of the bottom of the tank or sump pit if one is provided.

(b) Filling and discharge connections shall be provided with the manually operated valve required by § 40.10-40(d) and with a positive acting remote controlled quick-closing valve. The remote controlled quick-closing valve shall satisfy the requirements of § 40.10-40(e).

(c) For pressure vessel type tanks the remote controlled quick-closing valves shall be located on the inside of the tank or on the outside where the piping enters the tank.

(d) For nonpressure vessel type tanks the remote controlled quick-closing valves may be located at the loading and discharge headers.

§ 40.10-55 Cargo piping—TB/ALL.

(a) When propylene oxide is carried on board a vessel, piping systems in propylene oxide service shall not be used for any other product and shall be completely separate from all other systems. The piping system shall be designed so that no cross connection may be made through inadvertence.

(b) The piping system shall be designed for a working pressure of not less than the maximum pressure to which the system may be subjected, however, in no case shall the design pressure be less than 150 pounds per square inch. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall be not less than the pump or compressor discharge relief valve setting; or, provided the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(c) Piping shall be seamless drawn or electric resistance welded steel or stainless steel.

(d) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless pipe expansion bends or offsets. Suitable means shall be provided for maintaining the piping in a fixed position.

(e) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings and to prevent excessive vibration.

§ 40.10-60 Safety relief valves—TB/ALL.

(a) Each tank shall be fitted with one or more approved safety relief valves designed, constructed and flow-tested for capacity in conformance with subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489)

(b) Each safety relief valve shall be set to start to discharge at not less than 30 pounds per square inch gage, nor more than the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when all the safety relief valves are discharging. The minimum rates of discharge of safety relief valves for tanks shall not be less than that determined by the following formula.

$$Q=26.8A^{0.82} \quad (1)$$

where:

Q = Minimum required rate of discharge, in cubic feet per minute of standard air at 120 percent of the maximum set pressure of the safety relief valves. Discharge measured at 60° F. and atmospheric pressure (14.7 p.s.i.a.).

A = Total external surface area of the tank in square feet.

$A=\pi(D\times U)$ for cylindrical tanks with hemispherical heads.

$A=\pi D(U+0.3D)$ for cylindrical tanks with spherically dished or semiellipsoidal heads.

$A=\pi D^2$ for spherical tanks.

D = Outside diameter of the tank, in feet.

U = External over-all length of the tank, in feet.

(d) Safety relief valves shall be attached to the tank near the highest point of the vapor space. Shutoff valves shall not be installed between the tanks and safety relief valves except:

(1) Manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking shutoff valves so arranged that at all times the required relief valve capacity will be available to relieve internal pressure. The valve arrangement shall be such that no vapor will escape even if the "out of service" relief valve is removed.

(2) Auxiliary safety devices such as rupture disks or breaking pins, of suitable corrosion-resistant compatible material, may be installed between the tanks and the safety relief valves, subject to the approval of the Commandant.

(e) Each safety relief valve shall be tested in the presence of a marine inspector before being placed in service. The test shall satisfactorily indicate that the safety relief valves will start to discharge at a pressure of not less than 30 pounds per square inch gage, nor greater than the design pressure of the tank.

§ 40.10-65 Filling density—TB/ALL.

(a) Filling density shall not exceed 80 percent. Filling density is defined as the ratio of the weight of material which may be loaded into the tank to the weight of water the tank will hold at 60° F. expressed as a percentage.

§ 40.10-69 Venting—TB/ALL.

(a) Tanks carrying propylene oxide shall be vented through the safety relief valves independent of tanks carrying other products. Each safety relief valve installed on a cargo tank shall be connected to a venting system consisting of a branch vent from each cargo tank connected to a vent header which shall extend to a height above the weather deck to at least one-third the beam of the vessel and shall terminate at a comparable distance from any working or living space, ventilator inlet, or source of vapor ignition. When special conditions would prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height one-third of the beam of the vessel. During loading and unloading operations the displaced propylene oxide vapor shall be returned to the loading facility.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header vents as provided for in Table 40.10-69(b), and upon the total safety relief valve discharge.

TABLE 40.10-69(b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks	Percent of total valve discharge
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical damage and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow. A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(g) No shutoff valve of any type shall be fitted in the vent piping between the safety relief valve and the vent outlets.

(h) Suitable provision shall be made for draining condensate which may accumulate in the vent piping.

(i) The outlet of each vent riser will be fitted with acceptable corrosion-resistant flame screen of suitable material or a flame arrestor suitable for use with propylene oxide.

(j) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a height of not less than one-third the beam of the vessel but in no case less than 7 feet above the deck. Alternate arrangements consisting of a branch vent header system may be installed. In any case, all other provisions of paragraphs (a) through (i) of this section apply.

§ 40.10–73 Ventilation—TB/ALL.

(a) All enclosed spaces within the hull shall be vented or ventilated in accordance with the provisions of this subchapter except as otherwise provided for in this subpart.

(b) The enclosed spaces on tankships and manned barges in which the cargo tanks are located shall be rendered inaccessible to personnel while the vessel is underway and shall be inerted by injection of a suitable inert gas or shall be well ventilated.

(c) The enclosed spaces on tankships and manned barges in which the cargo tanks are located, if an inerting system is not installed, shall be fitted with forced ventilation of such capacity to provide a complete change of air every 3 minutes and arranged in such a manner that any vapors lost into the space will be removed. The ventilation system shall be in operation at all times cargo is being loaded or discharged. No electrical equipment shall be fitted within the spaces or within 10 feet of the ventilation exhaust from these spaces.

(d) All ventilation machinery shall be of nonsparking construction and shall not provide a source of vapor ignition.

(e) Each vent shall be fitted with a flame screen of corrosion-resistant wire which is suitable for use with propylene oxide.

§ 40.10–75 Cargo hose—TB/ALL.

(a) When the cargo hose is carried on board the vessel as part of its normal equipment, it shall meet the following requirements:

(1) Only flexible metal hose, fabricated of stainless steel or other acceptable metal, resistant to the action of propylene oxide, shall be used during filling and discharging of the tanks.

(2) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(3) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor safety relief valve.

(4) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be tested hydrostatically by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked by the manufacturer, with the maximum guaranteed pressure and with the words "Certified For Propylene Oxide".

(5) Cargo hose intended for propylene oxide service shall not be used for any other products except those which are compatible with propylene oxide.

(R.S. 4488, as amended, 46 U.S.C. 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 9057)

§ 40.10–80 Electrical bonding—TB/ALL.

(a) Each cargo tank shall be electrically bonded to the hull. The vessel shall be electrically bonded to the shore piping prior to connecting the cargo hose. This electrical bonding shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 40.10–83 Special cargo handling requirements—TB/ALL.

(a) Cargo shall be discharged by pumping or by displacement with nitrogen or other acceptable inert gas. In no case shall air be allowed to enter the system. During loading and unloading operations the vapor shall not be discharged to the atmosphere. Provisions shall be made to return all displaced vapor to the loading facility. The loading rate and the pressure applied to the tank to discharge the cargo shall be so limited that the safety relief valves will not be caused to open.

(b) The cargo shall be shipped under a suitable protective padding, such as nitrogen gas. Other gases proposed for use as padding may be given consideration by the Commandant. Original charging only of protective gas padding at the loading facility is not considered adequate. A sufficient amount of spare inerting gas as approved by the Commandant shall be provided on the vessel in order to maintain the proper concentration of the gas in the event of normal leakage or other losses.

(c) Any padding gas selected should be at least 98.0 percent inert gases, and free of reactive materials.

(d) A water spray extinguishing system shall be provided in the area where loading and unloading operations are conducted. The system shall be designed to operate automatically in case of fire. The capacity and arrangement shall be such as to blanket effectively the area in way of the loading manifold and exposed deck piping for propylene oxide. The rate of discharge and the arrangement of piping and nozzles shall be such as to give a uniform distribution over the entire area protected. Additionally, means shall be provided for local and remote manual operation. The arrangement shall be such that any spilled cargo will be washed away. A water hose with pressure to the nozzle, when atmospheric temperatures permit, shall be connected ready for immediate use during filling and discharge operations and any spillage of propylene oxide shall immediately be washed away.

(e) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header. The liquid and vapor discharged from these lines shall not be discharged to the atmosphere.

(f) Prior to loading, a sample from the cargo tank will be taken to insure that the pad gas will meet the requirements of paragraph (b) of this section and that the oxygen content of the vapor space will be not more than 2.0 percent maximum. If necessary, a sample will be taken after loading to insure the vapor space meets this requirement.

(g) The owner, master or person in charge of any vessel subject to the provisions of this part shall insure that during cargo transfer operations the persons required by Subpart 35.35 of this subchapter shall be especially qualified in the handling of propylene oxide.

(R.S. 4488, as amended, 46 U.S.C. 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 9057)

§ 40.10–85 Warning signs and information cards—TB/ALL.

Vessels carrying propylene oxide in bulk shall comply with the applicable provisions of § 35.01–55 of this subchapter.

(R.S. 4488, as amended, 46 U.S.C. 481; Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 9057)

§ 40.10–87 Tests and inspection—TB/ALL.

(a) Each tank shall be subject to the tests and inspections described in this paragraph in the presence of a marine inspector, except as otherwise provided in this section.

(1) An internal examination shall be made at least once in each 4 calendar years.

(2) A hydrostatic test of 1½ times the design pressure shall be made at least once in each 4 years at the time the internal examination is made and at such times as considered necessary by the marine inspector.

(3) To the extent and if deemed necessary by the marine inspector sufficient insulation shall be removed from insulated tanks at least once in each 4 calendar years to permit spot external examination of the tanks and insulation. The marine inspector may require that the thickness of the tanks be gaged by an acceptable nondestructive means without removal of insulation.

(4) The safety relief valves shall be tested by liquid, gas, or vapor pressure at least once every 2 years to determine the accuracy of adjustment and, if necessary shall be reset. Propylene oxide shall not be used as the testing medium.

(b) The cargo hose shall be inspected and tested at least once in each 2 calendar years.

(1) The cargo hose and piping shall be subjected to a hydrostatic test of 1½

times the maximum pressure to which they may be subjected in service.

(2) If any leakage, seepage or distortion is noted at any time, the hose shall be removed from service and replaced and/or the piping shall be repaired.

(R.S. 4453, as amended, 4488, as amended; 46 U.S.C. 435, 481; Treasury Dept. Order 167-38, Oct. 26, 1959, 24 F.R. 8857)

SUBCHAPTER E—LOAD LINES

PART 43—FOREIGN OR COASTWISE VOYAGE

Subpart 43.01—Administration

Section 43.01-1(d)(6) is amended to read as follows:

§ 43.01-1 Establishment of load lines.

* * * * *

(d) * * *

(6) Vessels which engage in voyages from a port or place in the United States to another port or place in the United States but during such voyages stop at a foreign port or place are considered to be on foreign voyages and subject to the requirements for such voyages. Although ports in the Canal Zone are foreign ports, a vessel engaged on a voyage between United States ports and making a direct transit of the Canal without "entry and clearance" (as defined in Bureau of Customs regulations) is considered to be on a coastwise voyage.

* * * * *

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-48, Oct. 19, 1962, 27 F.R. 10504)

SUBCHAPTER F—MARINE ENGINEERING

PART 51—MATERIALS

Subpart 51.04—Marine Boiler Steel Plate

§ 51.04-10 [Amended]

Section 51.04-10 *Test specimens* is amended by changing the phrase in the first sentence from "tension and bent test specimens" to "tension and bend test specimens".

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 52—CONSTRUCTION

Subpart 52.05—Cylindrical Shells

§ 52.05-10 [Amended]

1. Section 52.05-10 *Computations* is amended by revising Table 52.05-10(a) as follows:

a. In the first column "specification subpart" under "pipes and tubes" made of "electric-resistance welded pipe" the reference specification is changed from "31.45" to "51.34" for the last two entries.

b. In the fourth column "C.G. Grade" under "pipes and tubes" made of "electric-resistance-welded pipe", change the next to the last grade opposite the A.S.T.M. Grade "TP347" from "P347-R" to "P347-RW".

c. In the 16th column for metal temperatures of "1,100° F." for "castings" made of "alloy steel" change the numerals from "7,50" to "7,500" and "9,40" to "9,400" for the grades CF8 and CF8M, respectively.

Subpart 52.45—Combustion Chambers and Tube Sheets of Fire-Tube Boilers

2. Section 52.45-1(b) is amended by changing in the first sentence the phrase "combustible chamber" to "combustion chamber" so that the definition reads as follows:

§ 52.45-1 Definitions.

* * * * *

(b) *Separate combustion chamber.* Separate combustion chamber is a combustion chamber which is connected to one furnace only.

* * * * *

Subpart 52.55—Boiler and Superheater Tubes

3. Section 52.55-5(f)(1) is amended to read as follows:

§ 52.55-5 Materials and workmanship.

* * * * *

(f)(1) Boiler tubes may be arc- or gas-welded to manifolds, headers or drums without being expanded, provided the welds are strength welds complying with the requirements in this paragraph.

* * * * *

Subpart 52.65—Safety Valves

4. Section 52.65-1(b) is amended by changing the phrase from "against the heat" to "against the seat" so that the definition as amended reads as follows:

§ 52.65-1 Definitions.

* * * * *

(b) *Spring-loaded safety valve.* Spring-loaded safety valve is a safety valve fitted with a spring which normally holds the valve disk in a closed position against the seat and allows it to open or close at predetermined pressures. Spring-loaded safety valves are characterized by pop action.

* * * * *

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 54—UNFIRED PRESSURE VESSELS

Subpart 54.03—Design and Construction

§ 54.03-10 [Amended]

1. Section 54.03-10 *Cylindrical shells and heads* is amended by revising Table 54.03-10 by changing the numeral from "910,800" to "10,800" in the 12th column under the temperature 300° F., for seamless pipe or tubes opposite specification 51.73, A.S.T.M. designation B-111, A.S.T.M. Grade copper nickel tubes 70-30, and Coast Guard Grade B111-G.

§ 54.03-15 [Amended]

2. Section 54.03-15 *Tube sheets* is amended in paragraph (a) by indicating that the fourth definition following formula (8) is for the letter D which should read "D=mean gasket diameter for flanged attachment; inside diameter of shell when bolted attachment is not employed; or shortest span for noncircular tube sheets measured to centerline of gasket if bolted construction is employed; or to point of support if welded construction is employed; in inches."

§ 54.03-25 [Amended]

3. Section 54.03-25 *Bolted flanged connections* is amended by changing the title for Table 54.03-25(c1) from "Gasket Materials and Contract Facings" to "Gasket Materials and Contact Facings."

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

SUBCHAPTER H—PASSENGER VESSELS

PART 70—GENERAL PROVISIONS

Subpart 70.05—Application

1. Section 70.05-3(a)(2) is amended to read as follows:

§ 70.05-3 Foreign vessels subject to the requirements of this subchapter.

(a) * * *

(2) Foreign vessels, other than those mentioned in subparagraph (1) of this paragraph, which carry more than 6 passengers from any port in the United States, and which are:

(i) Sailing vessels of 100 gross tons or over and not more than 700 gross tons; or,

(ii) Non-self-propelled vessels of 100 gross tons.

* * * * *

2. Section 70.05-15 is amended to read as follows:

§ 70.05-15 Vessels subject to the act of May 10, 1956 (46 U.S.C. 390-390g).

(a) The act of May 10, 1956 (46 U.S.C. 390-390g), applies to vessels which carry more than six passengers and which are:

(1) Sailing vessels of 100 gross tons or over and not more than 700 gross tons; or,

(2) Non-self-propelled vessels of 100 gross tons.

(b) Sailing vessels of 100 gross tons or over and not more than 700 gross tons and non-self-propelled vessels of 100 gross tons, which are subject to the act of May 10, 1956, shall meet all of the applicable requirements of this subchapter, except that the certificate of inspection issued to the vessel shall be valid for a period of 3 years in lieu of 1 year, and reinspection will be made annually between inspections for certification.

(c) Sailing vessels of 100 gross tons or over and not more than 700 gross tons and non-self-propelled vessels of 100 gross tons, in existence or contracted for as passenger vessels prior to June 1, 1958, which are subject to the act of May 10, 1956, shall meet the applicable requirements of this subchapter insofar as

is reasonable and practicable in the opinion of the Officer in Charge, Marine Inspection. In this respect, he may grant departures from specific requirements of this subchapter if in his opinion the circumstances warrant such departure.

Subpart 70.10—Definition of Terms Used in This Subchapter

§ 70.10–21 [Amended]

3. Section 70.10–21 *International voyage* is amended by changing in paragraph (b) first sentence the name from "Great Lakes of North American" to "Great Lakes of North America."

4. Subpart 70.10 is amended by inserting after § 70.10–43 a new section reading as follows:

§ 70.10–44 Specially suitable for vehicles.

A space which is "specially suitable for vehicles" is one designed for the carriage of automobiles or other self-propelled vehicles with batteries connected and fuel tanks containing gasoline on vessels on ocean or unlimited coastwise voyages. Requirements for the design and protection of spaces "specially suitable for vehicles" appear in Subparts 72.15, 76.15, 77.05, 78.45, 78.47, and 78.83 of this subchapter. In addition, preparation of automobiles prior to carriage, with the exception of disconnecting battery cables, must be in accordance with the applicable provisions of § 146.27–30 of Subchapter N (Dangerous Cargoes) of this chapter.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4421, as amended, 4426, as amended, 4453, as amended, 4488, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1394, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 404, 390, 435, 481, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–38, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8557)

PART 71—INSPECTION AND CERTIFICATION

Subpart 71.65—Plan Approval

Section 71.65–15(a)(3) is amended by revising subdivisions (i) and (ii) to read as follows:

§ 71.65–15 Procedure for submittal of plans.

(a) • • •

(3) • • •

(i) Commander, 3d Coast Guard District (mmt), Governor's Island, New York, N.Y. 10004, for geographical area covered by 1st, 3d, and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, 423 Canal Street, New Orleans, La. 70130, for geographical area covered by 2d, 7th, and 8th Coast Guard Districts.

• • • • •

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 72—CONSTRUCTION AND ARRANGEMENT

Subpart 72.01—Hull Structure

§ 72.01–90 [Amended]

1. Section 72.01–90 is amended by changing the headnote from "Vessels contracted for prior for November 19, 1952" to "Vessels contracted for prior to November 19, 1952".

Subpart 72.15—Ventilation

2. Section 72.15–15 is amended by adding a paragraph (c) reading as follows:

§ 72.15–15 Ventilation for closed spaces.

• • • • •

(c) The ventilation of spaces which are "specially suitable for vehicles" shall be in accordance with the provisions of this paragraph. In addition, if vehicles are operated inside of enclosed spaces, the ventilation shall be in accordance with Subpart 78.83 of this subchapter.

(1) Areas below the weather deck shall be provided with continuous pressure-positive ventilation at each level on which vehicles are transported.

(2) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

(3) The ventilation shall be such as to prevent air stratification as well as to prevent accumulation of air pockets.

(4) An alarm system shall be provided which will indicate the loss of required ventilation. The alarm location shall be in a normally manned space acceptable to the Commandant.

Subpart 72.20—Accommodations for Officers and Crew

3. Section 72.20–55(a) is amended to read as follows:

§ 72.20–55 Insect screens.

(a) Except in such areas as are considered to be insect free, provisions shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, air ports, ventilators, and doors to unscreened spaces and the open deck, or by other methods. Insect screens are not required in air conditioned crew quarters for windows, air ports and doors that are normally kept closed.

• • • • •

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4490, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1394, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 392, 399, 404, 411, 435, 481, 482, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–38, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8557)

PART 73—WATERTIGHT SUBDIVISION

Subpart 73.15—Rules for Subdivision—Vessels in Services Other Than Ocean or Coastwise and Vessels Under 150 Gross Tons in Ocean or Coastwise Service and Not on an International Voyage

Section 73.15–5(b) is amended to read as follows:

§ 73.15–5 Compartmentation of all vessels other than ferry vessels.

• • • • •

(b) Every vessel of 100 gross tons or more, or carrying more than 49 passengers, shall be subdivided so as not to submerge the margin line with any one main compartment flooded.

• • • • •

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 3, 24 Stat. 129, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 886, as amended, sec. 5, 49 Stat. 1394, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 483, 395, 363, 86a, 88a, 369, 367, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–38, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8557; 167–48, Oct. 19, 1962, 27 F.R. 10504)

PART 75—LIFESAVING EQUIPMENT

Subpart 75.10—Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 75.10–20 [Amended]

1. Section 75.10–20 *Requirements for vessels in Great Lakes; lakes, bays, and sounds; or river service* is amended by

revising Table 75.10-20(a) so that the footnote for the last item under "vessels navigating routes lying at all points within a distance of 3 miles from land", columns 10 and 11, will show references to footnote "5" and "3" with the percentage "75".

§ 75.10-90 [Amended]

2. Section 75.10-90 *Vessels contracted for prior to May 26, 1965* is amended by changing the reference in the first sentence of paragraph (a)(2) from "in lieu of subparagraph (4) of this paragraph" to "in lieu of § 75.10-10(a)(4)".

Subpart 75.35—Installation of Lifeboats, Davits, and Winches

§ 75.35-5 [Amended]

3. Section 75.35-5 *Tests and examinations* is amended by changing in paragraph (b)(4)(v), first sentence, the phrase "nesting lifeboats" to "nested lifeboats".

Subpart 75.40—Life Preservers

4. Section 75.40-15(b) is amended to read as follows:

§ 75.40-15 Distribution.

* * * * *

(b) The additional life preservers required by § 75.40-10(b) shall be stowed in conspicuous places on deck, one of which shall be stowed near the bow.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857)

PART 76—FIRE PROTECTION EQUIPMENT

Subpart 76.05—Fire Detecting and Extinguishing Equipment, Where Required

1. Table 76.05-1(a) in § 76.05-1 is amended by adding under "Cargo spaces" requirements for spaces specially suitable for vehicles, and as amended this Table 76.05-1(a) reads as follows:

§ 76.05-1 Fire detecting systems.

* * * * *

TABLE 76.05-1(a)

Space	Detecting systems	Fixed extinguishing systems
Safety areas		
Wheelhouse or fire-control room	None required [1]	None required.[1]
Stairway and elevator enclosures	do.[1]	Do.[1]
Communication corridors	do.[1]	Do.[1]
Lifeboat embarkation and lowering stations	do	Do.
Radio room	do.[1]	Do.[1]
Accommodations		
Staterooms, toilet spaces, isolated pantries, etc.	do.[1]	Do.[1]
Offices, lockers, and isolated storerooms	Electric, pneumatic, or automatic sprinkling.[1]	Do.[1]
Public spaces	None required with 20-minute patrol. Electric, pneumatic, or automatic sprinkling with 1 hour patrol.[1]	Do.[1]
Open decks or enclosed promenades	None required	Do.
Service spaces		
Galleys	do.[1]	Do.[1]
Main pantries	do.[1]	Do.[1]
Motion picture booths and film lockers	Electric, pneumatic, or automatic sprinkling.[1 3]	Do.[1 3]
Paint and lamp rooms	Smoke detecting[2]	Carbon dioxide.[4]
Inaccessible baggage, mail, and specie rooms and storerooms.	do	Do.
Accessible baggage, mail, and specie rooms and storerooms.	Electric, pneumatic, or automatic sprinkling.	None required.[1]
Refrigerated storerooms	None required	Do.
Carpenter, valet, photographic, and printing shops, sales rooms, etc.	Electric, pneumatic, or automatic sprinkling.	Do.[1]
Machinery spaces		
Coal fired boilers: Bunker and boiler space	None required	None required.
Oil fired boilers: Spaces containing oil fired boilers either main or auxiliary, their fuel oil service pumps, and/or such other fuel oil units as the heaters, strainers, valves, manifolds, etc., that are subject to the discharge pressure of the fuel oil service pumps, together with adjacent spaces to which oil can drain.	do	Carbon dioxide or foam.[4]
Internal combustion or gas turbine propelling machinery spaces.	do	Carbon dioxide.[5]
Electric propulsive motors or generators of open type	do	None required.
Enclosed ventilating systems for motors and generators of electric propelling machinery.	do	Carbon dioxide (in ventilating system).[7]
Auxiliary spaces, internal combustion or gas turbine	do	Carbon dioxide.[5]
Auxiliary spaces, electric motors or generators	do	None required.
Auxiliary spaces, steam	do	Do.
Trunks to machinery spaces	do	Do.
Fuel tanks	do	Do.[6]
Cargo spaces		
Inaccessible during voyage (combustible cargo), including trunks (excluding tanks).	Smoke detecting	Carbon dioxide.[4]
Accessible during voyage (combustible cargo)	Smoke detecting, electric, pneumatic or automatic sprinkling.	Automatic or manual sprinkling.
Vehicular deck (except where no overhead deck is 30 feet in length or less).	None required	Manual sprinkling.
Cargo oil tanks	do	Carbon dioxide or foam.[4]
Specially suitable for vehicles	Smoke detecting, electric, pneumatic or automatic sprinkling.	Carbon dioxide, automatic or manual sprinkling.

[1] Vessels of 100 gross tons and over contracted for on or before May 27, 1936, and having combustible joiner work, shall be fitted with an automatic sprinkling system, except in relatively incombustible spaces.

[2] Sprinkler heads may be attached to sanitary system provided electrical or pneumatic detecting is installed.

[3] On vessels contracted for prior to November 19, 1952, electric or pneumatic detecting may be substituted.

[4] On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted. However, although existing steam smothering systems may be repaired, replaced, or extended, no new system contracted for on or after January 1, 1962, will be permitted.

[5] Protection of auxiliary boilers, fuel oil units, valves and manifolds not required on vessels contracted for prior to November 19, 1952.

[6] Not required on vessels of less than 300 gross tons (except on an international voyage) using fuel with a flashpoint higher than 110° F., where the space is normally manned.

[7] Not required on vessels contracted for prior to November 19, 1952.

[8] Not required on vessels of less than 300 gross tons nor on vessels contracted for prior to November 19, 1952, except where fuel, including starting fuel, has a flashpoint of 110° F. or less.

[9] Where fuel having a flashpoint of 110° F. or lower is used, the space containing the fuel tanks shall be protected by a carbon dioxide system.

Subpart 76.13—Steam Smothering System, Details

§ 76.13–90 [Amended]

2. Section 76.13–90 *Installations contracted for prior to January 1, 1962* is amended by changing the heading for the fourth column in Table 76.13–90(b) (4) from "pipe size in each branch, inches" to "pipe size of each branch, inches".

Subpart 76.15—Carbon Dioxide Extinguishing Systems, Details

3. Section 76.15–5 is amended by adding at end thereof a new paragraph (f) reading as follows:

§ 76.15–5 Quantity, pipe sizes, and discharge rate.

* * * * *

(f) *Spaces specially suitable for vehicles.* (1) The number of pounds of carbon dioxide required shall be equal to the gross volume of the largest "tight" space divided by 22. In no case, however, shall it be less than that required by paragraph (c) of this section.

(2) The arrangement of valves and piping shall be such that the required quantity of carbon dioxide may be discharged into any "tight" space. The discharge of the required quantity of carbon dioxide shall be completed within 2 minutes.

(3) Except as noted in subparagraphs (1) and (2) of this paragraph, the requirements of paragraph (c) of this section shall apply.

§ 76.15–40 [Amended]

4. Section 76.15–40 *Pressure relief* is amended by changing in the first sentence of paragraph (a) the phrase from "tight compartment" to "tight compartments".

Subpart 76.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements, and Details

§ 76.50–10 [Amended]

5. Section 76.50–10 *Location* is amended by revising Table 76.50–10(a) by inserting a reference to footnote "6" in the third column after the phrase "1 outside the space in the vicinity of exit" opposite the machinery spaces designated "Auxiliary spaces, internal combustion or gas turbine" in column one.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 1333, 390b, 80 U.S.C. 196; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4694; CGFR 56–38, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 77—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

Subpart 77.05—Electrical Engineering and Interior Communication Systems

1. Section 77.05–1 is amended by adding a new paragraph (b) reading as follows:

§ 77.05–1 Installation and details.

* * * * *

(b) Electrical equipment installed in spaces "specially suitable for vehicles" shall be in accordance with § 111.65–10 of Subchapter J (Electrical Engineering) of this chapter.

Subpart 77.27—Sounding Equipment

2. Section 77.27–1(a) is amended to read as follows:

§ 77.27–1 When required.

(a) All mechanically propelled vessels of 500 gross tons and over in ocean or coastwise service, and all mechanically propelled vessels of 500 gross tons and over in Great Lakes service certificated for service on the River St. Lawrence eastward of the lower exit of the St. Lambert Lock at Montreal, Canada, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus and a deep-sea hand lead. All other mechanically propelled vessels of 1,500 gross tons and over in Great Lakes service shall carry a deep-sea hand lead.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 1333, 390b, 80 U.S.C. 196; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4694; CGFR 56–38, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 78—OPERATIONS

Subpart 78.05—Notice to Mariners and Aids to Navigation

1. Section 78.05–1 is amended to read as follows:

§ 78.05–1 Duty of officers.

(a) Licensed deck officers are required to acquaint themselves with the latest information published by the Coast Guard and the U.S. Navy regarding aids to navigation. Neglect to do so is evidence of neglect of duty. It is desirable that all vessels have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(b) Weekly Notices to Mariners (Great Lakes Edition), published by the Commander, 9th Coast Guard District, contain announcements and information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained free of charge, by making application to Commander, 9th Coast Guard District.

(c) Weekly Notices to Mariners (Part I, Atlantic and Mediterranean) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 1st, 3d, 5th, 7th, and 8th Coast Guard Districts and the Greater Antilles Section. Foreign marine information in the Atlantic and Mediterranean area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(d) Weekly Notices to Mariners (Part II, Pacific and Indian Oceans) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 11th, 12th, 13th, 14th, and 17th Coast Guard Districts. Foreign marine information in the Pacific and Indian Oceans area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

Subpart 78.45—Display of Plans

2. Section 78.45–1(a)(1) is amended by adding requirements regarding cargo compartments specially suitable for vehicles so that it reads as follows:

§ 78.45–1 When required.

(a) * * *

(1) General arrangement plans showing for each deck the fire control stations, the various sections enclosed by fire-resisting bulkheads, the sections enclosed by fire-retarding bulkheads, together with particulars of the fire alarms, detecting systems, the sprinkler installation (if any), the fire extinguishing appliances, means of access to different compartments, decks, etc., and the ventilating systems including particulars of the master fan controls, the positions of dampers, the location of the remote means of stopping the fans, and identification numbers of the ventilating fans serving each section. If cargo compartments are "specially suitable for vehicles," they shall be so indicated on the plan. Alternatively, at the discretion of the Commandant, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy at all times shall be available on board in an accessible position.

* * * * *

Subpart 78.47—Markings for Fire and Emergency Equipment, Etc.

3. Subpart 78.47 is amended by inserting after § 78.47–70 a new section reading as follows:

§ 78.47–75 Ventilation alarm failure.

(a) The alarm required by § 72.15–15 (c)(4) of this subchapter, which indicates the loss of required ventilation in spaces specially suitable for vehicles, shall be marked with a conspicuous sign in at least ¼-inch letters "VENTILATION FAILURE IN VEHICULAR SPACE."

§ 78.47–90 [Amended]

4. Section 78.47–90 *Vessels contracted for prior to November 19, 1952,* is amended by changing in paragraph (a)(1) the reference from "§§ 78.47–5 through 78.47–70" to "§§ 78.47–5 through 78.47–75."

5. Part 78 is amended by inserting after § 78.80–35 a new Subpart 78.83, consisting of § 78.83–1, reading as follows:

Subpart 78.83—Operation of Vehicles in Enclosed Locations

§ 78.83–1 Special operating conditions.

(a) The operation of self-propelled vehicles in enclosed locations (other than power-operated industrial trucks when subject to Subpart 78.80 of this part) shall be permitted only when the other conditions in this section have been met.

(b) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of self-propelled vehicles shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working.

(c) When necessary, portable blowers of adequate size shall be utilized and so located as to prevent concentrations of carbon monoxide which may be harmful to personnel.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 435, 395, 363, 367, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, CGFR 56–28, July 24, 1956, 21 F.R. 5659)

SUBCHAPTER I—CARGO AND MISCELLANEOUS VESSELS

PART 90—GENERAL PROVISIONS

Subpart 90.10—Definition of Terms Used in This Subchapter

Subpart 90.10 is amended by inserting after § 90.10–37 a new section reading as follows:

§ 90.10–38 Specially suitable for vehicles.

A space which is "specially suitable for vehicles" is one designed for the carriage of automobiles or other self-propelled vehicles with batteries connected and fuel tanks containing gasoline on vessels on ocean or unlimited coastwise voyages. Requirements for the design and protection of spaces "specially suitable for vehicles" appear in Subparts 92.15, 95.05, 95.15, 96.05, 97.36, 97.37, and 97.80 of this subchapter. In addition, preparation of automobiles prior to carriage, with the exception of disconnecting battery cables, must be in accordance with the applicable provisions of § 146.27–30 of Subchapter N (Dangerous Cargoes) of this chapter.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4426, as amended, 4427, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 404, 405, 366, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659)

PART 91—INSPECTION AND CERTIFICATION

Subpart 91.55—Plan Approval

Section 91.55–15(a)(3) is amended by revising subdivisions (i) and (ii) to read as follows:

§ 91.55–15 Procedure for submittal of plans.

(a) • • •

(3) • • •

(i) Commander, 3d Coast Guard District (mmt), Governor's Island, New York, N.Y. 10004, for the geographical area covered by 1st, 3d, and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, 423 Canal Street, New Orleans, La. 70130, for geographical area covered by 2d, 7th, and 8th Coast Guard Districts.

• • • • •

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

PART 92—CONSTRUCTION AND ARRANGEMENT

Subpart 92.15—Ventilation

1. Section 92.15–10 is amended by adding at end thereof new paragraphs (d) and (e) reading as follows:

§ 92.15–10 Ventilation for closed spaces.

• • • • •

(d) The ventilation of spaces which are "specially suitable for vehicles" shall be in accordance with the provisions of this paragraph. In addition, if vehicles are operated inside of enclosed spaces, the ventilation shall be in accordance with Subpart 97.80 of this subchapter.

(1) Areas below the weather deck shall be provided with continuous pressure-positive ventilation at each level on which vehicles are transported.

(2) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

(3) The ventilation system shall be such as to prevent air stratification as well as to prevent the accumulation of air pockets.

(4) An alarm system shall be provided which will indicate the loss of required ventilation. The alarm location shall be in a normally manned space acceptable to the Commandant.

(e) For requirements regarding controls of electrically powered ventilation systems, see Subchapter J (Electrical Engineering) of this chapter.

Subpart 92.20—Accommodations for Officers and Crew

2. Section 92.20–55(a) is amended to read as follows:

§ 92.20–55 Insect screens.

(a) Except in such areas as are considered to be insect free, provisions shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, air ports, ventilators, and doors to unscreened spaces and the open deck or by other methods. Insect screens are not required in air conditioned crew quarters for windows, air ports, and doors that are normally kept closed.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8557)

PART 94—LIFESAVING EQUIPMENT

Subpart 94.40—Life Preservers

1. Section 94.40–10 is amended by revising paragraphs (a) and (c) to read as follows:

§ 94.40–10 Number required.

(a) Except as specifically modified by paragraph (b) of this section, all vessels shall be provided with an approved life preserver for each person on board. An additional number of life preservers shall be provided for the personnel on watch in the engineroom and pilothouse, and at the bow lookout.

• • • • •

(c) When children are carried, a suitable number of children's life preservers shall be provided.

2. Section 94.40–15(a)(1) is amended to read as follows:

§ 94.40–15 Distribution and stowage.

(a) *Distribution.* (1) Life preservers shall be distributed throughout the cabins, staterooms, berths, and other places convenient for each person on board. The stowage of the additional

number of life preservers required by § 94.40–10(a) shall be such that they are readily accessible to personnel on watch in the engineroom and pilothouse, and at the bow lookout.

• • • • •

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 95—FIRE PROTECTION EQUIPMENT

Subpart 95.05—Fire Detecting and Extinguishing Equipment, Where Required

1. Section 95.05–1 is amended to read as follows:

§ 95.05–1 Fire detecting, manual alarm, and supervised patrol systems.

(a) Fire detecting, manual alarm, and supervised patrol systems are not required except in special cases; but if installed, the systems shall meet the applicable requirements of Part 76 of Subchapter H (Passenger Vessels) of this chapter.

(b) In each compartment containing explosives, and in adjacent cargo compartments, there shall be provided a smoke detecting or other suitable type fire detecting system.

(c) Enclosed spaces which are "specially suitable for vehicles" shall be fitted with an approved fire or smoke detecting system.

2. Section 95.05–10(b) is amended by adding at end thereof a new subparagraph (4) reading as follows:

§ 95.05–10 Fixed fire extinguishing systems.

• • • • •

(b) • • •

(4) Spaces "specially suitable for vehicles" shall be fitted with an approved carbon dioxide system. Alternately, the Commandant may permit the installation of an approved water sprinkler system or other suitable system.

• • • • •

Subpart 95.10—Fire Main System, Details

§ 95.10–5 [Amended]

3. Section 95.10–5 *Fire pumps* is amended in paragraph (b) by changing the reference from "paragraph (c) of this paragraph" to "paragraph (c) of this section."

Subpart 95.15—Carbon Dioxide Extinguishing Systems, Details

4. Section 95.15–5 is amended by adding at end thereof a new paragraph (f) reading as follows:

§ 95.15–5 Quantity, pipe sizes, and discharge rates.

• • • • •

(f) *Spaces specially suitable for vehicles.* (1) The number of pounds of carbon dioxide required shall be equal to the gross volume of the largest "tight" space divided by 22. In no case, however, shall the quantity be less than that required by paragraph (c)(2) of this section.

(2) The arrangement of valves and piping shall be such that the required quantity of carbon dioxide may be discharged into any "tight" space. The discharge of the required quantity of carbon dioxide shall be completed within 2 minutes.

(3) Except as noted in subparagraphs (1) and (2) of this paragraph, the requirements of paragraph (e) of this section shall apply.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 96—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

Subpart 96.05—Electrical Engineering and Interior Communications Systems

1. Section 96.05–1 is amended by adding a new paragraph (b) reading as follows:

§ 96.05–1 Installation and details.

• • • • •

(b) Electrical equipment installed in spaces "specially suitable for vehicles" shall be in accordance with § 111.65–10 of Subchapter J (Electrical Engineering) of this chapter.

Subpart 96.17—Navigation Lights and Shapes [Canceled]

2. Subpart 96.17, consisting of § 96.17–1, is canceled.

§ 96.17–1 [Canceled]

3. Section 96.17–1 *When required* is canceled.

Subpart 96.20—Navigation Lights and Shapes, Whistles, Foghorns, Fog Bells, and Gongs

4. The heading for Subpart 96.20 is amended to read as set forth above.

5. Section 96.20–1 is amended to read as follows:

§ 96.20–1 Vessels operating on waters governed by the International Rules of the Road.

(a) All vessels (including motorboats) operating on waters governed by the International Rules of the Road (33 U.S.C. 1051–1094) shall be equipped with the navigation lights and shapes, whistles, foghorns, fog bells, and gongs, as required by those rules.

§ 96.20–5 [Canceled]

6. Section 96.20–5 *Motorboats operating on the high seas* is canceled.

7. Section 96.20–10 is amended to read as follows:

§ 96.20–10 Vessels operating on waters governed by the Inland, Great Lakes or Western Rivers Rules of the Road.

(a) All vessels, other than motorboats operating on waters governed by the Inland, Great Lakes or Western Rivers Rules of the Road (33 U.S.C. 154–232, 241–295, 301–355) shall be equipped with the navigation lights and shapes, whistles, foghorns, fog bells, and gongs as required by the Rules of the Road applicable to the waters on which the vessel is being navigated.

(b) All motorboats operating on waters governed by the Inland, Great Lakes or Western Rivers Rules of the Road shall be equipped with the following:

(1) Navigation lights as set forth in the Motorboat Act of April 25, 1940, as amended (46 U.S.C. 526–526u), or, in lieu thereof, the lights required by the International Rules of the Road.

(2) An efficient whistle or other sound producing mechanical device as set forth in Table 96.20–10(b)(2).

TABLE 96.20–10(b)(2)

Class of motorboat	Type of device
A (less than 16 feet in length).	None required by law.
1 (16 feet and over, and less than 26 feet in length).	Mouth, hand, or power operated, capable of producing a blast of 2 seconds or more duration, and audible for at least one-half mile.
2 (26 feet and over, and less than 40 feet in length).	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
3 (40 feet and over, and not over 65 feet in length).	Power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.

(3) An efficient fog bell, except that motorboats of less than 26 feet in length need not carry such a bell.

Subpart 96.23—Foghorns [Canceled]

8. Subpart 96.23, consisting of §§ 96.23–1 and 96.23–5, is canceled.

§ 96.23–1 [Canceled]

9. Section 96.23–1 *Vessels other than motorboats* is canceled.

§ 96.23–5 [Canceled]

10. Section 96.23–5 *Motorboats* is canceled.

Subpart 96.25—Fog Sound Signal Devices [Canceled]

11. Subpart 96.25, consisting of §§ 96.25–1 to 96.25–10, inclusive, is canceled.

§ 96.25–1 [Canceled]

12. Section 96.25–1 *Vessels other than motorboats* is canceled.

§ 96.25–5 [Canceled]

13. Section 96.25–5 *Motorboats operating on the high seas* is canceled.

§ 96.25–10 [Canceled]

14. Section 96.25–10 *Motorboats operating on the navigable waters of the United States* is canceled.

Subpart 96.27—Sounding Equipment

15. Section 96.27–1(a) is amended to read as follows:

§ 96.27–1 When required.

(a) All mechanically propelled vessels of 500 gross tons and over in ocean or coastwise service and all mechanically propelled vessels of 500 gross tons and over in Great Lakes service and certificated for service on the River St. Lawrence eastward of the lower exit of the St. Lambert Lock at Montreal, Canada, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus and a deep-sea hand lead. All other mechanically propelled vessels of 1,500 gross tons and over in Great Lakes service shall carry a deep-sea hand lead.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 97—OPERATIONS

Subpart 97.05—Notice to Mariners and Aids to Navigation

1. Section 97.05–1 is amended to read as follows:

§ 97.05–1 Duty of officers.

(a) Licensed deck officers are required to acquaint themselves with the latest information published by the Coast Guard and the U.S. Navy regarding aids to navigation. Neglect to do so is evidence of neglect of duty. It is desirable that vessels other than motorboats shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(b) Weekly Notices to Mariners (Great Lakes Edition), published by the Commander, 9th Coast Guard District, contain announcements and information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained free of charge, by making application to Commander, 9th Coast Guard District.

(c) Weekly Notices to Mariners (Part I. Atlantic and Mediterranean) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 1st, 3d, 5th, 7th, and 8th Coast Guard Districts and the Greater Antilles Section. Foreign marine information in the Atlantic and Mediterranean area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the United States Consulates where they may be inspected.

(d) Weekly Notices to Mariners (Part II, Pacific and Indian Oceans) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 11th, 12th, 13th, 14th, and 17th Coast Guard Districts. Foreign marine information in the Pacific and Indian Oceans area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

Subpart 97.12—Cargo Stowage

§ 97.12–5 [Amended]

2. Section 97.12–5 *Manual* is amended by changing the date of the manual from "1959" to "1966", and by revising footnote 1 with this date to read "Copies of this manual are on file at Coast Guard Headquarters and with the various Coast Guard District Commanders for reference purposes."

Subpart 97.36—Display of Plans

3. Section 97.36–1(a) is amended to read as follows:

§ 97.36–1 When required.

(a) Barges with sleeping accommodations for more than six persons and all self-propelled vessels shall have permanently exhibited for the guidance of the officer in charge of the vessel, general arrangement plans showing for each deck the various fire-retardant bulkheads together with particulars of the fire detecting, manual alarm and fire extinguishing systems, fire doors, means of ingress to the different compartments, and the ventilating systems including the positions of the dampers, the location of the remote means of stopping the fans, and the identification of the fans serving each section. If cargo compartments are "specially suitable for vehicles," they shall be so indicated on the plan.

Subpart 97.37—Markings for Fire and Emergency Equipment, Etc.

§ 97.37–40 [Amended]

4. Section 97.37–40 *Liferafts, lifefloats and buoyant apparatus* is amended in paragraph (b) by changing the phrase from "rigid type liferaft, lifeboat and buoyant apparatus" to "rigid type liferaft, lifefloat, and buoyant apparatus".

5. Subpart 97.37 is amended by inserting after § 97.37–47 a new section reading as follows:

§ 97.37–50 Ventilation alarm failure.

(a) The alarm required by § 92.15–10(d)(4) of this subchapter, which indicates the loss of required ventilation in spaces specially suitable for vehicles, shall be marked with a conspicuous sign in at least ¼-inch letters "VENTILATION FAILURE IN VEHICULAR SPACE."

§ 97.37–90 [Amended]

6. Section 97.37–90 *Vessels contracted for prior to November 19, 1952,* is amended by revising in paragraph (a)(1) the reference from "§§ 97.37–5 through 97.37–47" to "§§ 97.37–5 through 97.37–50."

7. Part 97 is amended by adding after § 97.75–1 a new Subpart 97.80, consisting of § 97.80–1, reading as follows:

Subpart 97.80—Operation of Vehicles in Enclosed Locations

§ 97.80–1 Special operating conditions.

(a) The operation of self-propelled vehicles in enclosed locations (other than power-operated industrial trucks when subject to Subpart 97.70 of this part) shall be permitted only when the other conditions in this section have been met.

(b) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of self-propelled vehicles shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working.

(c) When necessary, portable blowers of adequate size shall be utilized and so located as to prevent concentrations of carbon monoxide which may be harmful to personnel.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 435, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659)

PART 98—SPECIAL CONSTRUCTION, ARRANGEMENT, AND PROVISIONS FOR CERTAIN DANGEROUS CARGOES IN BULK

Subpart 98.01—Application

1. Section 98.01–5 is amended by adding a new paragraph (d) reading as follows:

§ 98.01–5 Effective date.

* * * * *

(d) The provisions of Subpart 98.18 of this part regarding phosphoric acid in bulk shall be in effect on and after January 1, 1967.

2. Part 98 is amended by inserting after § 98.15–50 a new Subpart 98.18, consisting of §§ 98.18–1 to 98.18–50, inclusive, reading as follows:

Subpart 98.18—Phosphoric Acid in Bulk

Sec.
98.18–1 General.
98.18–5 How acid may be carried.
98.18–10 Gravity type cargo tanks.
98.18–15 Pressure-vessel type cargo tanks.
98.18–20 Installation.
98.18–25 Openings in tanks.
98.18–30 Cargo piping.
98.18–35 Outage.
98.18–40 Tank linings.
98.18–45 General requirements.
98.18–50 Tests and inspections.

AUTHORITY: The provisions of this Subpart 98.18 issued under R.S. 4405, as amended, 4462, as amended, 4472, as amended; 46 U.S.C. 375, 416, 170. Interpret or apply R.S. 4417a, as amended, 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–36, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

§ 98.18–1 General.

(a) The term "phosphoric acid" as used in this subpart shall include, in addition to phosphoric acid, aqueous solutions of phosphoric acid, and super phosphoric acid.

(b) Phosphoric acid may be carried in bulk in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(c) Any vessel carrying phosphoric acid in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.18–5 How acid may be carried.

(a) Phosphoric acid may be carried in either gravity or pressure type cargo tanks. The tanks shall be rubber-lined, or lined or clad with other suitable material acceptable to the Commandant, or shall be fabricated of a phosphoric acid resistant stainless steel, such as Type 316.

(b) The Commandant may permit the transportation of phosphoric acid in tanks fabricated of materials other than as specified in paragraph (a) of this section if it is shown to his satisfaction that the proposed method or design provides a degree of safety consistent with the minimum requirements of this subpart.

§ 98.18–10 Gravity type cargo tanks.

(a) Gravity type cargo tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is the greater. The plate thickness of any part of the tank shall not be less than ⅜ inch. The vessel's shell plating shall not be used as any part of the boundaries of these cargo tanks.

(b) Each gravity type tank shall be vented to atmosphere. A vent shall be fitted having a cross-sectional area of not less than that of the filling line unless an ullage opening is provided having a cross-sectional area at least equal to that of the filling line. The minimum size of a cargo tank vent shall not be less than 2½ inches. The outlet end of the vent shall terminate above the weather deck, clear of all obstructions and away from any source of flame. The vent shall terminate in a gooseneck bend or a corrosion-resistant pressure-vacuum relief valve. No shutoff valve or frangible disc shall be fitted in the vent lines.

(c) Pressure shall not be used to discharge cargo from gravity type cargo tanks.

§ 98.18–15 Pressure-vessel type cargo tanks.

(a) Pressure-vessel type cargo tanks shall be independent of the vessel's structure and shall be designed for the maximum pressure to which they may be subjected when loading, storing, or discharging the cargo, but in no case shall the design pressure be less than 30 pounds per square inch.

(b) Pressure-vessel type cargo tanks shall be designed as Class II or Class III unfired arc-welded cylindrical pressure vessels, inspected and tested as required by Subchapter F (Marine Engineering) of this chapter.

(c) When pressure is used to discharge the cargo, the tank shall be fitted with a vent led to atmosphere. The vent shall have a rupture disk designed to burst at a pressure not exceeding the design pressure of the tank. An auxiliary vent to relieve the pressure or vacuum in the tank during filling or discharge of the cargo may be led from the vent line between the tank and the rupture disk. A shutoff valve may be fitted in the auxiliary vent.

(d) Except as otherwise specified in this section, the vent shall conform to the requirements of § 98.18–10(b).

§ 98.18–20 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of the tanks, or such tanks shall be made movable.

§ 98.18–25 Openings in tanks.

(a) Openings in tanks are prohibited below deck, except for access openings used for inspection and maintenance of tanks, or unless otherwise specifically approved by the Commandant. Openings shall be fitted with bolted cover plates and acid-resistant gaskets.

§ 98.18–30 Cargo piping.

(a) Where special arrangements are approved by the Commandant to permit a pump suction to be led from the bottom of the tank such bottom suctions shall be fitted with a shutoff valve as close to the tank opening as practicable and operable from the weather deck.

(b) Cargo piping, including valves, fittings, and flanges where exposed to the acid, shall be rubber-lined, or lined, coated or clad with other corrosion resistant material, or shall be fabricated of a phosphoric acid resistant stainless steel, such as Type 316. Vent piping, including flanges and fittings, shall be similarly protected at least to the height of the frangible disc if such is installed.

§ 98.18–35 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent.

§ 98.18–40 Tank linings.

(a) Before a lining is applied the interior surfaces of cargo tanks shall be made smooth, welds chipped or ground smooth, and the surfaces thoroughly cleaned. All interior surfaces of the tanks shall be maintained free from scale, oxidation, moisture and all foreign matter during the lining process.

(b) The rubber or other approved lining material shall be resistive to attack by phosphoric acid; homogeneous, nonporous, and imperforate when applied; and not less elastic than the metal of the tank proper. It shall be of substantially uniform thickness, not less than ¼ inch for rubber lining. The lining shall be directly bonded to the tank plating, or attached by other satisfactory means acceptable to the Commandant.

(c) Rubber lining shall be scarfed at the joints to overlap at least 1½ inches, and the faying surfaces shall be beveled to an angle of approximately 45 degrees with vulcanizing being done in place.

§ 98.18–45 General requirements.

(a) All enclosed compartments containing phosphoric acid cargo tanks and all machinery spaces containing cargo pumps for handling phosphoric acid shall be fitted with effective means of ventilation.

(b) Cargo pumps where exposed to acid shall be made of corrosion-resistant material, or shall be suitably protected against corrosive attack.

(c) When air pressure is used to transfer the cargo an oil and water separator shall be fitted in compressed air lines to the tank.

(d) The use of naked lights and artificial lights, other than electric lights or portable battery lights, is prohibited during the filling and discharging operations. Smoking is prohibited and the master or officer in charge of the vessel shall post "No Smoking" signs during filling and discharging operations.

(e) During cargo transfer operations, a water hose shall be connected ready for immediate use and any leakage or spillage of acid shall be immediately washed away.

(f) Tanks approved for the transportation of phosphoric acid shall not be used for the transportation of any other commodity, except upon authorization by the Commandant (MMT).

(g) Phosphoric acid adulterated by other chemicals, inhibitors, oils, solvents, etc., shall not be transported in bulk cargo tanks except upon authorization by the Commandant (MMT).

(h) A vessel during transfer of cargo shall display a red flag by day or a red light by night, except when at anchor the day signal only shall be shown. Such signals when displayed shall be so placed as to be visible on all sides.

§ 98.18–50 Tests and inspections.

(a) Each gravity type cargo tank shall be tested before being placed into service as prescribed in § 98.18–10(a).

(b) Each cargo tank shall be subjected to an internal examination at least once in every 4 years. Where the lining of the cargo tank has deteriorated in service or is not in place, the marine inspector may require such tank to be subjected to the prescribed hydrostatic test if deemed necessary to determine the condition of the tanks.

Subpart 98.35—Portable Tanks for Combustible Liquids

§ 98.35–1 [Amended]

3. Section 98.35–1 *Scope* is amended by changing a phrase in second sentence of paragraph (a) from "portable tank" to "portable tanks".

(R.S. 4405, as amended, 4462, as amended, 4472, as amended; 46 U.S.C. 375, 416, 170. Interpret or apply R.S. 4417a, as amended, 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–38, Oct. 26, 1959, 24 F.R. 8857)

SUBCHAPTER J—ELECTRICAL ENGINEERING

PART 110—GENERAL PROVISIONS

Subpart 110.10—Reference Specifications, Standards, and Codes

1. Section 110.10–1 is amended by adding subparagraph (18) to paragraph (e) and paragraph (h), reading as follows:

§ 110.10–1 General.

* * * * * * *

(e) * * *

(18) Standards for Industrial Control Equipment for Use in Hazardous Locations, Subject 698.

* * * * * *

(h) Recommended practices in effect on the date the vessel is contracted for, issued by Instrument Society of America, 530 William Penn Place, Pittsburgh, Pa. 15219:

(1) Recommended Practice, Intrinsically Safe and Non-Incendive Electrical Instruments (RP 12.2).

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

Subpart 110.15—Definition of Terms Used in This Subchapter

§ 110.15–85 [Amended]

2. Section 110.15–85 *Generation and distribution terms* is amended by changing in paragraph (e) the word from "produced" to "provided."

3. Section 110.15–100 is amended by adding a new paragraph (l) reading as follows:

§ 110.15–100 Instrument and meter terms.

* * * * * *

(l) *Intrinsically safe instrument and equipment or wiring.* The term "intrinsically safe" when used with instruments and equipment or wiring shall mean such instruments and equipment or wiring that is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration. Abnormal conditions will include accidental damage to any part of the instrument and equipment or wiring, insulation, failure of electrical components, and other faulty conditions.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4463, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 247, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 111—ELECTRICAL SYSTEM; GENERAL REQUIREMENTS

Subpart 111.05—General Requirements

1. Section 111.05–5(b)(4) is amended by revising subdivisions (i) and (ii) to read as follows:

§ 111.05–5 Plan approval.

* * * * * *

(b) *Procedure for submittal of plans.* * * *

(i) Commander, 3d Coast Guard District (mmt), Governor's Island, New York, N.Y. 10004, for geographical area covered by 1st, 3d, and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, 423 Canal Street, New Orleans, La. 70130, for geographical area covered by 2d, 7th, and 8th Coast Guard Districts.

* * * * * *

Subpart 111.25—Motors

§ 111.25–10 [Amended]

2. Section 111.25–10 *Temperature limitations* is amended by revising Table 111.25–10(a2) in paragraph (a) by inserting the value "100" in the 7th column, first line, under headings "Class H insulation," and "50° C. ambient temperature."

Subpart 111.35—Switchboards and Propulsion Controls

§ 111.35–1 [Amended]

3. Section 111.35–1 *General requirements* is amended by changing in the second sentence of paragraph (b) the phrase from "clear deck beams" to "clear overhead deck beams."

Subpart 111.45—Motor Circuits and Controllers

4. Section 111.45–1(e) is amended to read as follows:

§ 111.45–1 Motor controllers, general requirements.

* * * * * *

(e) *Adjacent to motor and driven machinery.* Generally a controller shall be located adjacent to the motor and its driven machinery. Where it is desired to group motor controllers at a central location or where, for other reasons, it is not feasible to locate a controller adjacent to the motor and its driven machine, the installation shall comply with one of the conditions listed in this paragraph.

(1) The motor and controller disconnecting means required by § 111.45–30 shall be capable of being locked in the open circuit position. However, if the disconnecting means is not within sight of the controller location or is more than 50 feet distant from the controller, subparagraph (2) or (3) of this paragraph shall be complied with.

(2) A manually operable switch which will disconnect the motor from its source of supply shall be provided adjacent to the motor location. This switch shall be rated in accordance with the appropriate requirements of § 111.45–30.

(3) A maintaining type switch in the motor control circuit shall be provided adjacent to the motor which will prevent the motor from being energized.

* * * * * *

§ 111.45–5 [Amended]

5. Section 111.45–5 *Motor overcurrent protection* is amended by changing the phrase at the end of subparagraph (b)(3) from "motor full-load line" to "motor full-load line current".

§ 111.45–30 [Amended]

6. Section 111.45–30 *Disconnecting means* is amended by changing in paragraph (e)(2)(ii) the phrase "no-voltage release" to "low voltage release".

Subpart 111.50—Distribution and Circuit Loads

§ 111.50–20 [Amended]

7. Section 111.50–20 *Circuit loads and demand factors* is amended by changing Table 111.50–20(a) in paragraph (a) to read as follows:

TABLE 111.50-20 (a)—*Demand loads*

Type of circuit	Demand load
Generator cables	125 percent of continuous generator rating.
Switchboard bus-tie, except ship's service to emergency switchboard bus-tie.	75 percent of generating capacity of the larger switchboard.
Emergency switchboard bus-tie.	125 percent of continuous rating of emergency generator.
Feeder supplying two or more motors.	125 percent of the rating of the largest motor plus 100 percent of the sum of the ratings of all other motors supplied and including 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.[1]
Feeder supplying two or more cargo winch motors arranged for the "Burtoning" method of cargo handling.	125 percent of the rating of the largest motor plus 35 percent of the sum of the ratings of all other motors supplied.[1]
Feeder supplying two or more 'tween deck cargo winch motors, cargo elevator motors, or cargo cranes.	125 percent of the rating of the largest motor plus 50 percent of the sum of the ratings of all other motors supplied.
Feeder supplying lighting and power transformers.	100 percent of the rated primary line current of the transformer.
Secondary feeders between transformers and distribution point.	100 percent of the rated secondary line current of the transformer.
Galley equipment feeder.	100 percent of either the first 50 KW or one-half the connected load, whichever is the larger, plus 65 percent of the remaining connected load, plus 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.
Lighting feeder	100 percent of the connected load plus the average active circuit load for the spare switches or circuit breakers on the distribution panels.
Grounded neutral of a dual voltage feeder.	100 percent of the capacity of the ungrounded conductors when grounded neutral is not protected by a circuit breaker overcurrent trip, or not less than 50 percent of the capacity of the ungrounded conductors when the grounded neutral is protected by a circuit breaker overcurrent trip.

[1] Where a large number of motors are supplied from one feeder and the character of the load is such that not all motors will be operated simultaneously, a smaller demand load may be approved.

• • • • •

Subpart 111.55—Overcurrent Protection

8. Section 111.55–1 is amended by adding paragraph (k) at the end thereof reading as follows:

§ 111.55–1 Installation of overcurrent devices.

• • • • •

(k) *Transformer feeder circuits.* The conductors of transformer primary and secondary feeder circuits shall be provided with short circuit protection and shall be protected by overcurrent devices located at the source of supply to the primary, rated or set at 100 percent of the smaller of the primary and secondary feeder conductors (taking into account the transformer ratio as necessary). The rating or setting of the overcurrent devices shall not exceed 115 percent of the rated primary current of the transformer.

9. Section 111.55–15(b) is amended to read as follows:

§ 111.55–15 Construction and use of overcurrent devices.

• • • • •

(b) *Plug fuses and fuseholders of Type S.* Plug fuses and fuseholders of Type S may be employed for applications at not over 125 volts; 0 to 15 amperes, 16 to 20 amperes, and 21 to 30 amperes.

• • • • •

Subpart 111.60—Wiring Methods and Materials

10. Section 111.60–10 is amended by revising paragraph (b)(8) to read as follows:

§ 111.60–10 Wire and cable installation.

• • • • •

(b) • • •

(8) *Feeder and branch circuit cables.* Cable of every description shall be located with a view to avoiding, as far as practicable, spaces where excessive heat and gases may be encountered, as well as spaces where they may be exposed to damage, such as exposed sides of deckhouses. Electrical conductors shall not enter oil tanks except as permitted by § 111.65–3 and § 38.15–15 of Subchapter D (Tank Vessels) of this chapter. Conductors shall avoid cofferdams adjacent to and extending below the tops of oil tanks except as permitted by §§ 111.60–40, 111.65–3, and 111.70–10.

• • • • •

11. Section 111.60–35(a)(3) is amended to read as follows:

§ 111.60–35 Lighting fixtures.

(a) *General requirements.* • • •

(3) Fixture globes shall be protected by guards except in living quarters, wheelhouse, gyro room, radio room, galley, and similar spaces where not subject to mechanical damage. The lamps of incandescent lighting fixtures located in propulsion machinery spaces, boiler spaces, and other spaces where flammable liquids are piped under pressure shall be protected by globes, or by similar means, that will prevent a liquid from impinging directly on the lamp bulb when sprayed on the fixture from any direction.

• • • • •

12. Section 111.60–40 is amended to read as follows:

§ 111.60–40 Wiring methods and materials for hazardous locations.

(a) *General.* (1) The provisions of this section apply to locations in which equipment and wiring are subjected to the conditions indicated by the classifications covered by subparagraphs (8) through (10) of this paragraph. It is necessary that each compartment or area containing electrical equipment be considered individually in order to determine its hazard classification. Except as modified by this section, all other applicable rules contained in this subchapter shall apply to electrical equipment and wiring installed in hazardous locations.

(2) The term "explosionproof" as used in this section shall mean enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(3) (i) The term "intrinsically safe" when used with instruments and equipment or wiring shall mean such instruments and equipment or wiring that is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration.

(ii) Intrinsically safe instruments and equipment or wiring may be installed in any hazardous area for which it has been approved by the Commandant. It may be used in lieu of explosionproof equipment. Detailed requirements are contained in § 111.65–3.

(4) Through the exercise of ingenuity in the layout of electrical installations for hazardous locations, it is frequently possible to locate much of the equipment in less hazardous or in nonhazardous areas and thus reduce the amount of special equipment required. The amount of electrical equipment or wiring in hazardous locations shall be minimized.

(5) The intent of this section is to require a form of construction of equipment, and of installation that will insure safe performance under conditions of proper use and maintenance. It is necessary, therefore, that more than ordinary care be exercised with regard to the installation and maintenance of equipment and wiring in hazardous areas.

(6) Explosionproof switches and switches controlling explosionproof equipment shall have a pole for each circuit conductor.

(7) The explosive characteristics of various atmospheric mixtures of hazardous gases, vapors, and dusts depend on the specific hazardous material involved. It is necessary, therefore, that equipment be designed not only for the class of location but also for the specific gas, vapor or dust that will be present. For the purpose of approval, the following atmospheric mixtures have been grouped on the basis of their explosive characteristics:

Group A, Atmospheres containing acetylene;

Group B, Atmospheres containing hydrogen, or gases or vapors of equivalent hazard, such as manufactured gas;

Group C, Atmospheres containing ethyl ether vapor;

Group D, Atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors, and natural gas;

Group E, Atmospheres containing metal dust;

Group F, Atmospheres containing carbon black, coal or coke dust; and

Group G, Atmospheres containing grain dust.

(8) Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitible

mixtures. Class I locations shall include the following.

(i) Class I, Division 1, Locations: (*a*) in which hazardous concentrations of flammable gases or vapors exist continuously, intermittently, or periodically under normal operating conditions; (*b*) in which hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or (*c*) in which breakdown or faulty operation of equipment or processes which may release hazardous concentrations of flammable gases or vapors, might also cause simultaneous failure of electrical equipment. This classification would usually include locations such as cargo tanks, cargo pumprooms, cofferdam areas, and in some cases open deck areas, storage and mixing rooms for paint and allied products, storage rooms for oil, oil lamps and the like, battery rooms, and hospital operating rooms in which combustible anesthetics may be administered.

(ii) Class I, Division 2, Locations: (*a*) in which flammable volatile liquids or flammable gases are handled, processed or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of abnormal operation of equipment; (*b*) in which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, but which might become hazardous through failure or abnormal operation of the ventilating equipment; or (*c*) which are adjacent to Class I, Division 1 locations, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided. This classification would usually include locations where flammable volatile liquids or flammable gases or vapors are used, but which in the judgment of the Commandant would become hazardous only in case of an accident or of some unusual operating conditions. The quantity of hazardous material that might escape in case of accident, the adequacy of ventilating equipment, and the total area involved shall receive consideration in determining the classification and extent of each hazardous area.

(iii) Special limitations and requirements for electrical installations in hazardous locations on tank vessels are contained in Subpart 111.70 of this part.

(9) Class II locations are those in which combustible dust is or may be in the air continuously, intermittently, or periodically under normal conditions, in quantities sufficient to produce explosive or ignitible mixtures.

(i) This classification would usually include the working areas handling bulk grain and similar products, coal pulverizing plants (except where the pulverizing equipment is essentially dusttight), and the like.

(10) Class III locations are those in which easily ignitible fibers or materials producing combustible flyings are handled or used.

(i) Easily ignitible fibers and combustible flyings will include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste, kapok, Spanish moss, excelsior, sawdust, and other materials of similar nature.

(ii) Class III locations will usually include areas where the above products are handled in bulk, and in carpenter shops and similar locations.

(11) Where it is specified in this section that equipment shall be approved for Class I or Class II locations, approval by an independent testing laboratory is required. This approval shall be based on the tests outlined in the Underwriters' Laboratories, Inc. Standards for Industrial Control Equipment for Use in Hazardous Locations, Subject 698. Equipment that bears the Underwriters' Laboratories, Inc. label is acceptable for the class of hazardous locations indicated on the label.

(b) *Electrical installations in Class I, Division 1, Groups A, B, C, and D hazardous locations*—(1) *Meters, instruments and relays.* Meters, instruments and relays, including kilowatt-hour meters, instrument transformers and resistors, rectifiers and thermionic tubes, shall be provided with explosionproof enclosures approved for Class I locations.

(2) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses, including pushbuttons, relays and similar devices, shall be provided with enclosures, and the enclosures in each case together with the enclosed equipment, shall be approved as a complete assembly for use in Class I locations.

(3) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, together with any switching mechanism associated with them, shall be provided with explosionproof enclosures approved for Class I locations.

(4) *Motors and generators.* Motors, generators and other rotating electrical machinery shall be of enclosed explosionproof type approved for Class I locations.

(5) *Lighting fixtures.* Each lighting fixture shall be approved as a complete assembly for Class I locations, and shall be clearly marked to indicate the maximum wattage of lamps for which it is approved. Fixtures intended for portable use shall be specifically approved as a complete assembly for that use.

(i) *Mechanical injury.* Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement.

(ii) *Supports.* Boxes, box assemblies, or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class I locations.

(6) *Appliances, fixed and portable.* Appliances, including electrically heated and motor-driven appliances, shall be approved for Class I locations.

(7) *Flexible cords.* A flexible cord may be used only for connections between a portable lamp or a portable appliance and the fixed portion of its supply circuit, and, where used, shall be of a type approved for extra hard usage; shall contain, in addition to the conductors of the circuit, a grounding conductor, shall be connected to terminals or to supply conductors in an approved manner, shall be supported by clamps or by other suitable means in such a manner that there will be no tension on the terminal connections, and shall be provided with suitable seals where the flexible cord enters boxes, fittings, or enclosures of the explosionproof type.

(i) Where flexible cords may be exposed to liquids having a deleterious effect on rubber, they shall be of a type approved for use under such conditions.

(8) *Receptacle and attachment plugs.* Receptacles and attachment plugs shall be of the polarized type providing for connection to the grounding conductor of the flexible cord and shall be approved for Class I locations.

(9) *Signal, alarm, remote-control and communication systems.* Signal, alarm, remote-control and communication systems, irrespective of voltage, shall be approved for Class I locations.

(10) *Wiring methods.* (i) Electric cables shall be leaded and armored, or impervious sheathed and armored, or mineral-insulated metal sheathed.

(ii) The cable entrance to each explosionproof device shall be sealed to prevent the passage of gases, vapors, or flame from within the explosionproof enclosure.

(iii) The seal fitting shall be located as close as practicable to, but in no case more than 18 inches from, the enclosure, and shall be connected thereto by means of a short length of rigid metal conduit with threaded explosionproof joints each having at least 5 full threads engaged. Type MI cables, however, shall enter enclosures directly through explosionproof fittings especially approved for Class I locations.

(iv) Except for type MI cables, all cable covering except the individual conductor insulation shall be removed in way of the seal fitting, and the seal fitting filled with a sealing compound.

(v) The sealing compound shall be approved for the purpose, shall not be effected by the surrounding atmosphere or liquids, and shall not have a melting point of less than 93 degrees C.

(vi) In the completed seal, the minimum thickness of the sealing compound shall be not less than the trade size of the conduit, and in no case less than ⅝ inch.

(vii) Splices and taps shall not be located in the seal fitting, nor shall other fittings in which splices or taps are made be filled with compound.

(c) *Electrical installations in Class I, Division 2, Groups A, B, C, and D hazardous locations*—(1) *Equipment with sliding contacts or contacts for making or breaking current, relays, switches, circuit breakers, motor controllers, and fuses.*

All switching and current interrupting mechanisms shall be provided with explosionproof enclosures approved for Class I locations, unless provided with nonexplosionproof enclosures otherwise suited to the location where installed with features described in subparagraph (2) of this paragraph, and interruption of current occurs in a chamber hermetically sealed against the entrance of gases and vapors or the current interrupting contacts are oil immersed and the device is approved for the location.

(2) *Meters, instruments, transformers, resistors, thermionic tubes, solenoids, and impedance coils.* Equipment which does not incorporate sliding or make and break contacts shall be provided with explosionproof enclosures approved for Class I locations, unless provided with nonexplosionproof enclosures otherwise suited to the location where installed with vents adequate to permit prompt escape of any gases or vapors. The maximum operating temperature of any exposed surface shall not exceed 80 percent of the ignition temperature in degrees centigrade of the gas or vapor involved.

(3) *Motors and generators.* Motors, generators and other rotating electrical machinery in which are employed sliding contacts, centrifugal or other types of switching mechanism (including motor overcurrent devices), or integral resistance devices, either while starting or while running, shall be of enclosed explosionproof type approved for Class I locations. Nonexplosionproof enclosed motors such as squirrel cage induction motors without brushes, switching mechanisms, etc., are permitted.

(4) *Lighting fixtures.* Each lighting fixture shall either be approved for Class I locations or shall be provided with globes and guards and, under normal operating conditions, the lamps shall not reach surface temperatures exceeding eighty percent (80%) of the ignition temperature in degrees Centigrade of the gas or vapor involved. Pendent fixtures shall be in accordance with paragraph (b)(5)(i) of this section.

(5) *Appliances, fixed and portable.* Motors, switches, circuit breakers and fuses shall conform to subparagraphs (1) through (3) of this paragraph. Electrically heated appliances shall be approved for Class I locations.

(6) *Flexible cords.* Flexible cords shall conform to paragraph (b)(7) of this section.

(7) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall conform to paragraph (b)(8) of this section.

(8) *Wiring methods.* Explosionproof enclosures and equipment shall conform to subparagraph (b)(10) of this paragraph. Nonexplosionproof equipment and enclosures shall conform to § 111.60–15.

(d) *Electrical installations in Class II hazardous locations*—(1) *Switches, circuit breakers, motor controllers, and fuses.* Switches, circuit breakers, motor controllers and fuses, including pushbuttons, relays and similar devices, which are intended to interrupt current in the normal performance of the function for which they are installed, or which are installed where dusts of an electrically conducting nature may be present, shall be provided with dusttight enclosures approved for Class II locations.

(i) Disconnecting and isolating switches containing no fuses and not intended to interrupt current, and which are not installed where dust may be of an electrically conducting nature, shall be provided with tight metal enclosures which shall be equipped with close-fitting covers, or with other effective means to prevent the escape of sparks or burning material, and shall have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of dust or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, and any overcurrent devices or switching mechanisms associated with them, shall have dusttight enclosures approved for Class II locations.

(3) *Motors and generators.* Motors, generators and other rotating-electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe-ventilated, or totally enclosed fan-cooled, and shall be approved for Class II locations.

(4) *Appliances, fixed and portable.* Appliances, fixed and portable, including electrically heated and motor-driven appliances, shall be approved for Class II locations.

(5) *Lighting fixtures.* Each lighting fixture, fixed or portable, shall be approved for Class II locations, and shall be clearly marked to indicate the maximum wattage of the lamp for which it is approved. Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement. Boxes, box assemblies, or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class II locations.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall be polarized type providing for connection to the grounding conductor of the flexible cord, and shall be approved for Class II locations.

(7) *Signal, alarm, remote-control, and communication systems.* (i) Switches, circuit breakers, relays, contactors, and fuses which may interrupt other than voice currents, and current-breaking contacts for bells, horns, howlers, sirens and other devices in which sparks or arcs may be produced shall be provided with dusttight enclosures approved for Class II locations.

(ii) Resistors, transformers, and choke coils which may carry other than voice currents, and rectifiers, thermionic tubes, and other heat generating equipment or apparatus shall be provided with dusttight enclosures approved for Class II locations.

(8) *Wiring methods*—(i) *Fittings and boxes.* Fittings and boxes shall be provided with threaded bosses for terminal tubes, shall have close fitting covers, and shall have no openings (such as holes for attaching screws) through which sparks or burning material might escape. Fittings or boxes in which taps, joints or terminal connections are made, or which are used in locations where dusts are of an electrically conducting nature, shall be approved for Class II locations.

(ii) *Electric cables.* Electric cables shall be leaded and armored, impervious sheathed and armored, or mineral-insulated metal sheathed. Cable entrances shall be made dusttight by terminal tubes or, in case of Type MI cable, by fittings designed for that purpose.

(iii) *Flexible connections.* Where necessary to employ flexible connections, dusttight flexible connectors, flexible metal conduit, or flexible cord approved for extra hard usage and provided with bushed fittings shall be used, except that where dusts are of an electrically conducting nature, flexible metal conduit shall not be used, and flexible cords shall be provided with dust seals at both ends. Where flexible cords are subject to oil or other corrosive conditions, the conductors shall be of a type approved for the condition. An additional conductor for grounding shall be provided in the flexible cord.

(e) *Electrical installations in Class III hazardous locations*—(1) *Switches, circuit breakers, motor controllers, and fuses.* Switches, circuit breakers, motor controllers, and fuses, including pushbuttons, relays, and similar devices, shall be provided with tight metal enclosures which shall be equipped with close fitting covers, or with other effective means to prevent escape of sparks or burning material, and shall have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, shall conform to paragraph (d)(2) of this section.

(3) *Motors and generators.* Motors, generators, and other rotating electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe-ventilated, or totally enclosed fan-cooled.

(4) *Appliances, fixed and portable.* Appliances, fixed and portable, shall conform to the requirements of this subparagraph.

(i) *Heaters.* Electrically heated appliances shall be provided with dusttight enclosures, and shall be approved for Class III locations.

(ii) *Motors.* Motors of motor-driven appliances shall conform to subparagraph (3) of this paragraph. Appliances which may be readily moved from one location to another shall conform to

requirements for the most hazardous location.

(iii) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses shall conform to the requirements of paragraph (d)(1) of this section.

(5) *Lighting fixtures.* Lighting fixtures shall conform to the requirements of this subparagraph.

(i) *Construction.* Each fixture shall be of dusttight type so designed that in the event of burnout of lamp or lampholder, no spark or hot metal can escape from the fixture. Unless each fixture is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(ii) *Mechanical injury.* A fixture which may be exposed to mechanical injury shall be protected by a suitable guard.

(iii) *Supports.* Boxes, box assemblies, or fittings used for the support of lighting fixtures shall be of a type approved for the purpose.

(iv) *Portable lamps.* Portable lamps shall be dusttight and shall be protected with substantial guards. Lampholders shall be of unswitched type with no exposed metal parts. Unless the portable lamp is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall conform to the requirements of paragraph (d)(6) of this section.

(7) *Signal, alarm, remote-control and communication systems.* Signal, alarm, remote-control and communication systems shall conform to the requirements of paragraph (d)(7) of this section.

(8) *Wiring methods.*—(i) *Fittings and boxes.* Fittings and boxes in which taps, joints, or terminal connections are made shall be provided with close fitting covers, or other effective means to prevent the escape of sparks or burning material, and shall have no openings (such as holes for attaching screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible materials might be ignited.

(ii) *Electric cables.* Electric cables shall conform to the requirements of paragraph (d)(8)(ii) of this section.

(iii) *Flexible connections.* Flexible connections shall conform to the requirements of paragraph (d)(8)(iii) of this section.

Subpart 111.65—Special Requirements for Certain Locations and Systems

13. Subpart 111.65 is amended by inserting after § 111.65–1 a new § 111.65–3 reading as follows:

§ 111.65–3 Special requirements for intrinsically safe systems.

(a) *Application.* (1) Intrinsically safe systems may be installed in any hazardous area as permitted by § 111.60–40(a)(3)(ii).

(b) *General requirements.* (1) Intrinsically safe systems shall be approved by the Commandant for each specific atmosphere.

(2) The recommended practice for Intrinsically Safe and Non-Incendive Electrical Instruments (RP 12.2) published by the Instrument Society of America is recognized as a guide for approval of intrinsically safe equipment by the Commandant.

(c) *Submittals required for approval.* (1) Detailed assembly drawings, list of material, wiring diagrams, and descriptions of operation. The hazardous atmosphere Class and Group as defined in § 111.60–40(a) shall be indicated.

(2) Detailed analysis of the maximum possible energy that may be released under normal and abnormal conditions.

(i) The term "normal condition" means that equipment operating at maximum available voltage and current.

(ii) The term "abnormal condition" means that equipment operating under conditions resulting from accidental damage to any part of the equipment or wiring, insulation or other failure of electrical components, application of overvoltage, adjustment and maintenance operations, and other similar conditions. The analysis of an "abnormal condition" of equipment will be considered to be not more than two independent faults in a combination.

(d) *Coast Guard evaluation and test procedure.* (1) The material submitted shall be evaluated for suitability and energy level. Subparagraph (3) of this paragraph contains data pertaining to energy level which will be used in evaluation of the material submitted.

(i) Where evaluation indicates the current and voltage levels are not more than that listed in Table 111.65–3(d)(1) for ignition of the specific atmospheric mixture of the gas group involved, the requirements for testing may be waived by the Commandant.

TABLE 111.65–3 (d)(1)—PERCENTAGE OF CURRENT AND VOLTAGE LEVELS FOR IGNITION OF SPECIFIC ATMOSPHERIC MIXTURES OF A GAS GROUP

	No normally operating contacts (percent)	Normally operating contacts (percent)
Normal conditions	25	25
Abnormal conditions	50	25

(ii) Where evaluation indicates the current and voltage levels are more than that listed in Table 111.65–3(d)(1) for ignition of the specific atmospheric mixture of the gas group involved, or in any case where the complexity of the circuit is such that circuit analysis is not acceptable, the Commandant will require the equipment to be tested by an approved laboratory.

(2) For purposes of evaluation, energy that may be released from a capacitive and inductive circuit can be calculated by the following methods:

(i) Capacitors; the maximum energy, "W," available from capacitors is the total stored energy as determined by the following formula:

$$W = \tfrac{1}{2} CV^2 \qquad (1)$$

where:

C is capacitance in farads.
V is the maximum instantaneous voltage on the capacitor in volts.
W is energy in joules.

(ii) Inductors; the maximum energy available from an inductor when the current is interrupted is the total stored energy, "W," as determined by the following formula:

$$W = \tfrac{1}{2} LI^2 \qquad (2)$$

where:

W is energy in joules.
L is the inductance in henries.
I is the maximum instantaneous value of the interrupted current in amperes.

(3) Gases are grouped according to their ignitibility as specified in § 111.60–40(a)(7). The energy required for igniting the most easily ignited mixture of a typical member of each group of gases under conditions more severe than are likely to be encountered in a practical installation have been determined by experiment. Figures 111.65–3(d)(3)(i) through 111.65–3(d)(3)(iii) are plots of the lowest level of current as a function of inductance for ignition of the specific gas group involved. Figures 111.65–3(d)(3)(iv) through 111.65–3(d)(3)(vi) are plots of the lowest level of capacitor voltage as a function of capacitance for ignition of the specific gas group involved. These plots may be used for determining acceptable current and voltage levels for use in connection with intrinsically safe calculations.

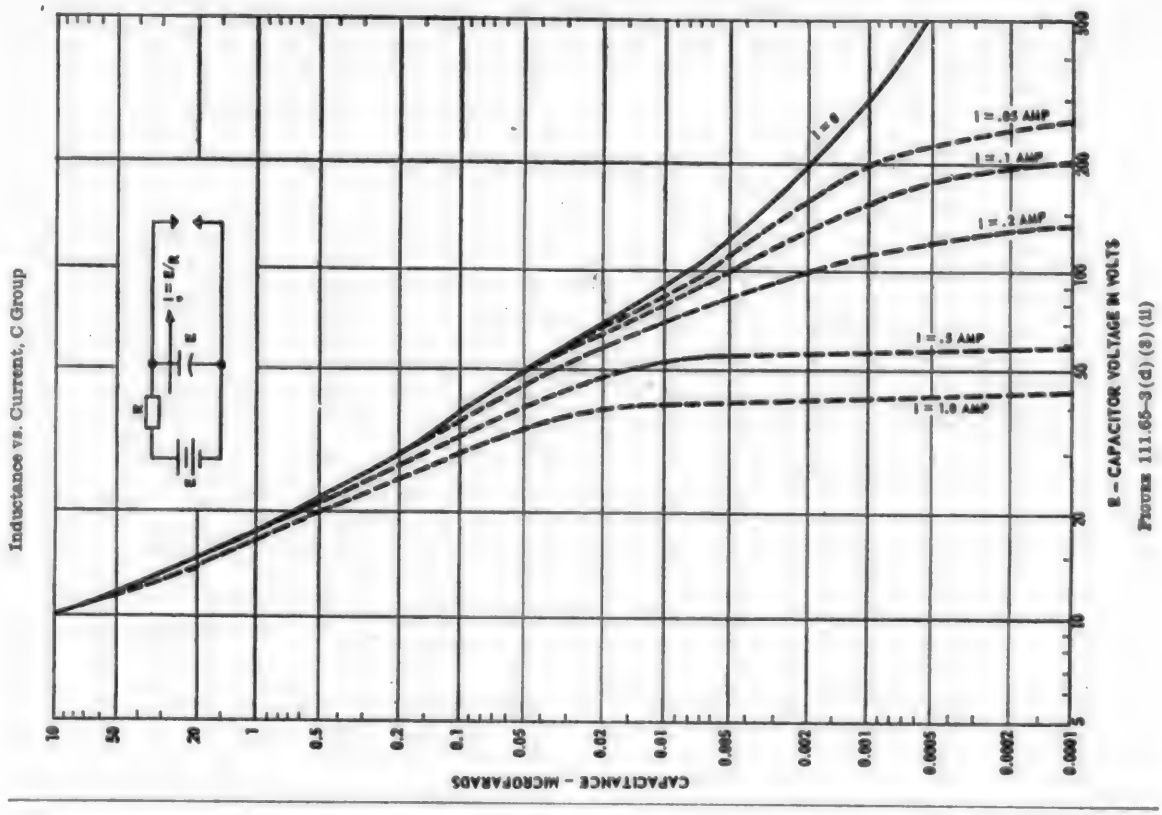

FIGURE 111.65-3(d) (3) (ii)

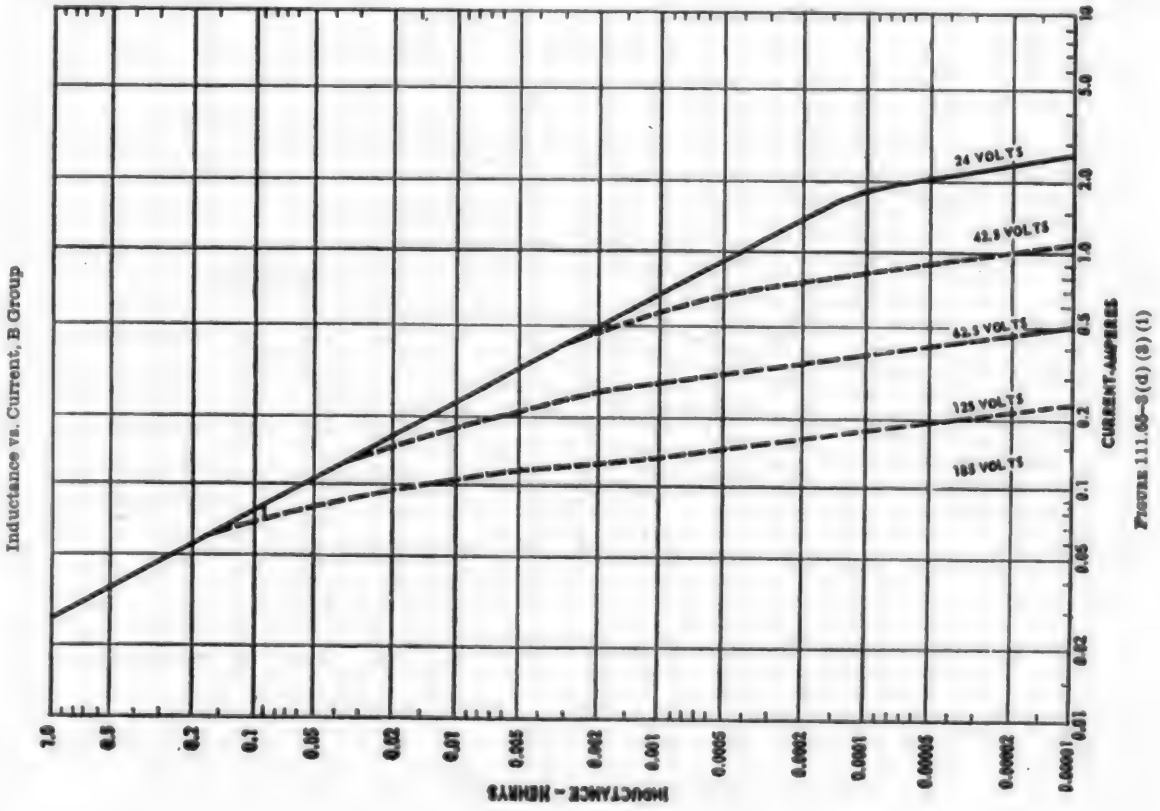

FIGURE 111.65-3(d) (3) (i)

Capacitance vs. Current, B Group

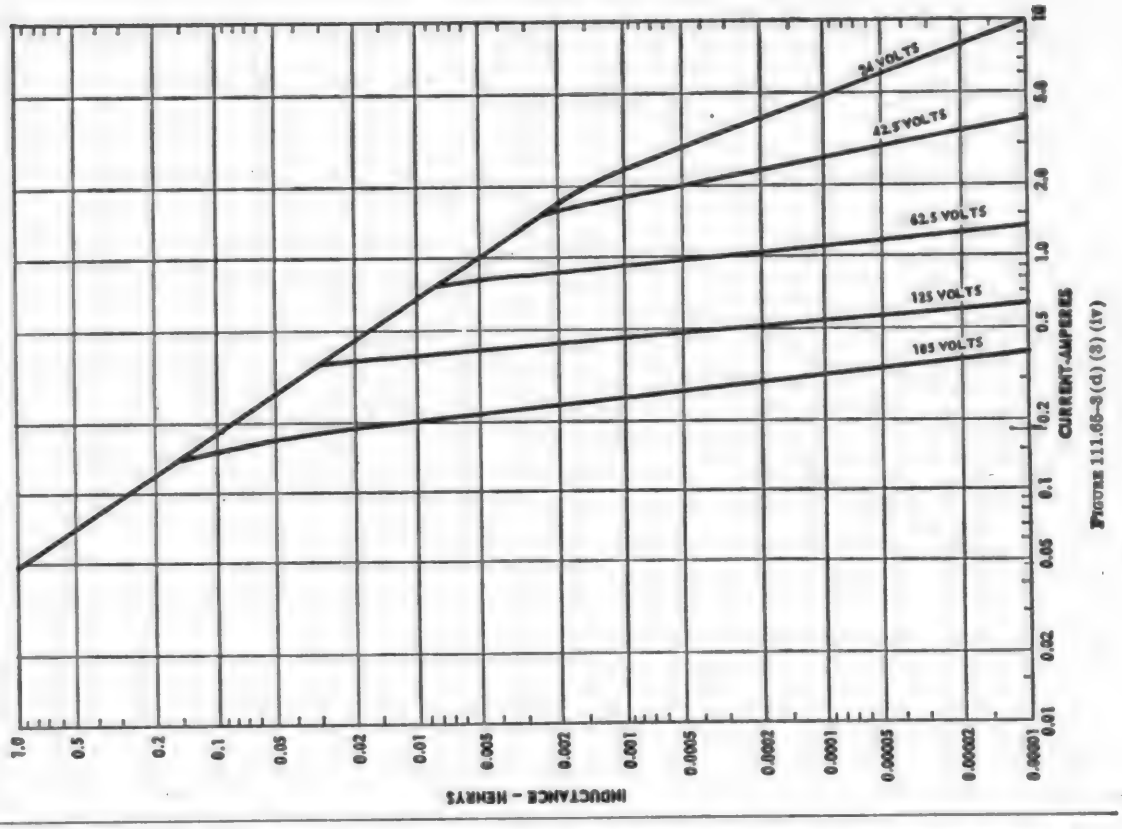

FIGURE 111.66-3(d) (3) (iv)

Inductance vs. Voltage, D Group

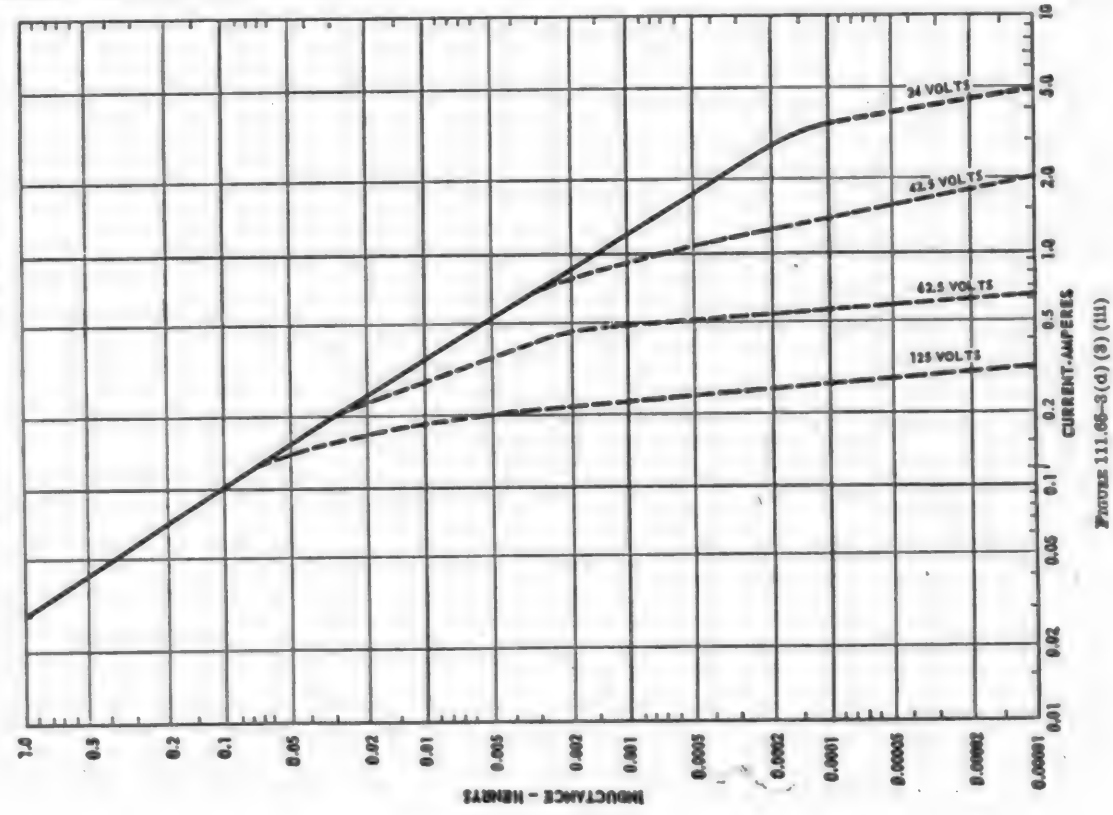

FIGURE 111.66-3(d) (3) (iii)

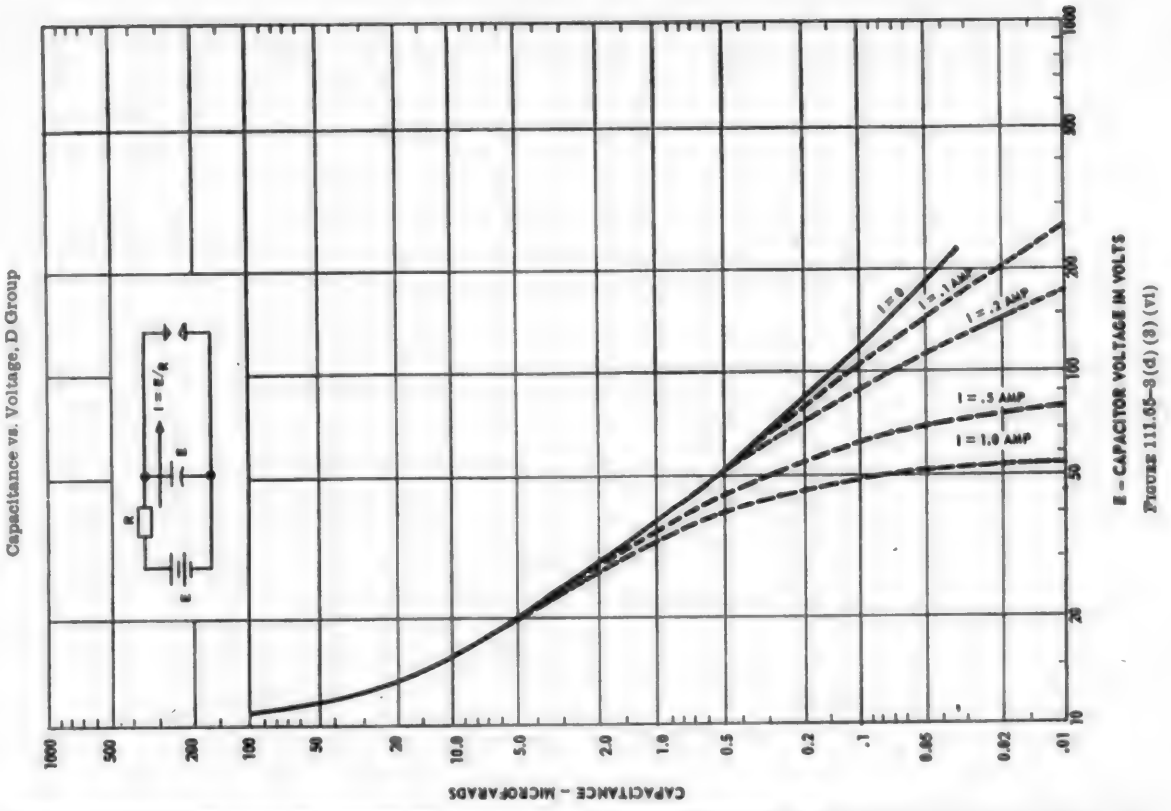

FIGURE 111.65-3(d) (3) (vi)

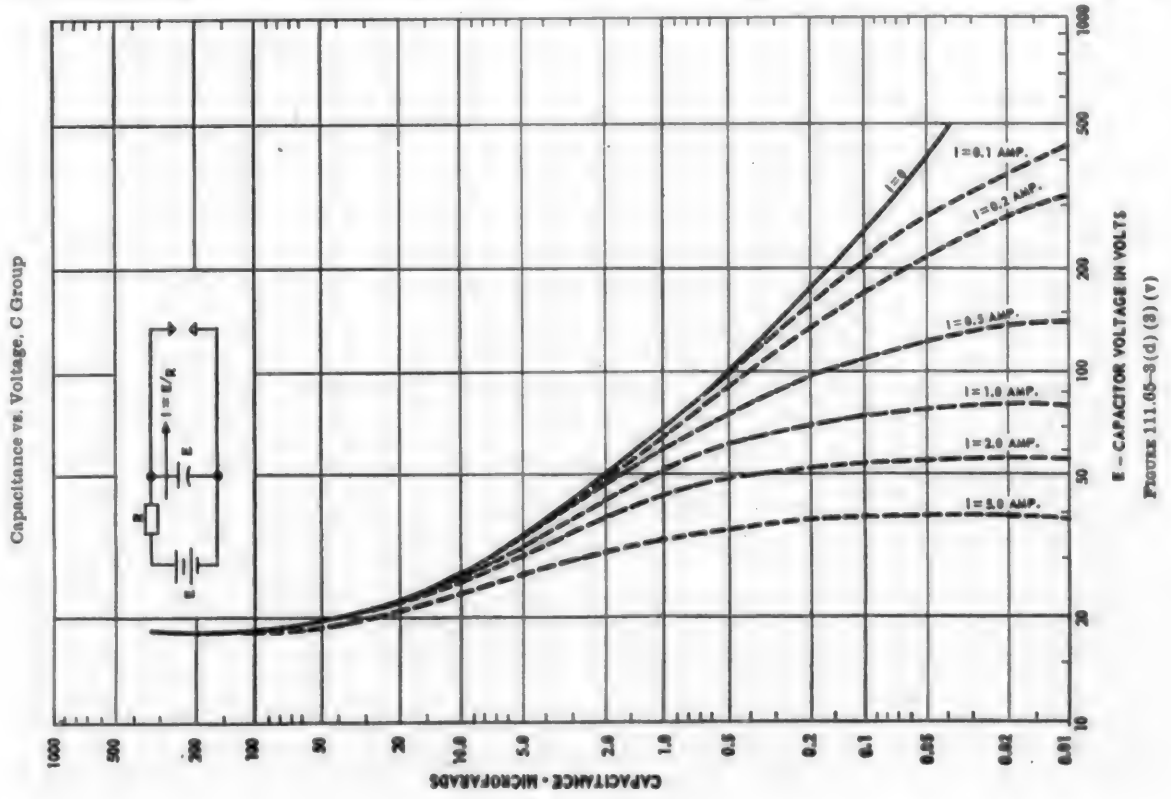

FIGURE 111.65-3(d) (3) (v)

(e) *Testing requirements.* (1) Tests conducted for purposes of compliance with subparagraph (d)(1) of this section shall experimentally determine whether or not the most ignitible gas involved can be ignited as a result of any possible function, malfunction, or failure of the component concerned.

(2) Independent laboratories that are acceptable to the Commandant shall perform the required tests in accordance with a testing procedure approved by the Commandant. The original and 3 copies of the laboratory test report shall be submitted to the Commandant (without cost to the Coast Guard) directly by the laboratory, and one copy will be forwarded to the manufacturer when he is advised of the Commandant's actions taken under this section. The independent laboratory shall inform the Commandant in advance when designated tests will be performed so that a marine inspector may be present.

(f) *Wiring installation.* The wiring installation for the intrinsically safe section of each approved installation shall comply with Subpart 111.60 of this part except where exempted by this subpart and:

(1) The cable insulation shall be compatible with the liquid or vapor to which it may be exposed; and,

(2) The intrinsically safe conductors shall be separated from all other conductors to insure that the intrinsically safe circuit is not compromised by becoming energized by other conductors through damage or failure of insulation or by induction from other sources.

14. Section 111.65–10 is amended to read as follows:

§ 111.65–10 Special requirements for locations where gasoline or other highly volatile motor fuel is carried in vehicles.

(a) *Application.* The provisions of this section are applicable to spaces which are "specially suitable for vehicles" as defined in § 70.10–44 in Subchapter H (Passenger Vessels) and § 90.10–38 in Subchapter I (Cargo and Miscellaneous Vessels) of this chapter. Electrical requirements for spaces other than those "specially suitable for vehicles" are contained in § 146.27–30 of Subchapter N (Dangerous Cargoes) of this chapter.

(b) *General requirements.* Electrical equipment which tends to produce arcs or sparks, such as cutouts, switches, receptacles, lampholders, generators, motors, or other equipment having make-or-break or sliding contacts, when installed within 18 inches of the deck, shall be of a type approved for Class I, Group D locations, in accordance with § 111.60–49(b). Electrical equipment installed at or over 18 inches above the deck shall be of the totally enclosed type or drip-proof protected equipment provided with suitable guards or screens to prevent escape of sparks or hot metal particles.

Subpart 111.70—Special Requirements for Tank Vessels

15. Section 111.70–5(h) is amended to read as follows:

§ 111.70–5 Definitions.

* * * * *

(h) *Liquefied flammable gas—TB/ALL.* The term "liquefied flammable gas" means any flammable gas having a Reid[1] vapor pressure exceeding 40 pounds, which has been liquefied.

* * * * *

16. Section 111.70–10 is amended by revising subparagraphs (3) and (4) in paragraph (c) to read as follows:

§ 111.70–10 Special requirements for tank vessels contracted for on or after November 19, 1955—TB/ALL.

* * * * *

(c) *Installation requirements on tank vessels handling Grade A, B, C or D liquid cargo.* * * *

(3) *Cable.* Through runs of electric cable, regardless of how they may be protected, are prohibited in cargo pumprooms, except where permitted by § 111.-65–3. In any enclosed space immediately above or adjacent to cargo tanks other than cargo pumprooms, through runs of electric cable are permitted.

(4) *Weather decks.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo pumproom doors or ventilation outlets, or cargo tank vent terminations shall be explosionproof. Explosionproof equipment installed in locations exposed to the weather shall be waterproof or shall be enclosed in watertight housings, or protected against the entrance of water by other approved means.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 113—COMMUNICATION AND ALARM SYSTEMS AND EQUIPMENT

Subpart 113.25—General Alarm Systems

1. Section 113.25–10 is amended by revising subdivision (ii) in subparagraph (3) and subparagraph (5) in paragraph (a) to read as follows:

§ 113.25–10 General requirements.

(a) *Power supply.* * * *

(3) * * *

(ii) Duplicate storage batteries so connected, in combination with a manual two-position transfer switch (having no OFF position), that one battery will be charged while the other battery is available for furnishing power to the system. Control, indicator, and alarm loads may be supplied from these batteries. Each of the two storage batteries shall have sufficient capacity to supply the general alarm system continuously for a period of at least 4 hours and to supply all other connected loads at maximum expected demand for a period of at least 8 hours without being recharged;

* * * * *

(5) When the general alarm system is supplied from an emergency or interior communication switchboard, or when the duplicate general alarm batteries supply other loads as permitted by subdivision (3)(ii) of this paragraph, the fused switch or circuit breaker supplying the general alarm system shall have provisions for locking to prevent unauthorized operation of the switch or circuit breaker and unauthorized tampering with the fuses.

* * * * *

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

SUBCHAPTER P—MANNING OF VESSELS

PART 157—MANNING REQUIREMENTS

Subpart 157.30—Special Provisions

1. Section 157.30–10 is amended to read as follows:

§ 157.30–10 Officers for uninspected vessels.

(a) For the purpose of this section and R.S. 4438a, as amended (46 U.S.C. 224a), the definitions of the following expressions, which are the same as those set forth in Article 2 of the Officers' Competency Certificates Convention, 1936, are:

(1) "Master" means any person having command or charge of a vessel.

(2) "Navigating officer in charge of the watch" means any person, other than a pilot, who is for the time being actually in charge of the navigation or maneuvering of a vessel.

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[1] American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products (Reid Method).

(3) "Chief engineer" means any person permanently responsible for the mechanical propulsion of a vessel.

(4) "Engineer officer in charge of the watch" means any person who is for the time being actually in charge of the running of a vessel's engines.

(b) Every vessel, however propelled, 200 gross tons or over and navigating the high seas and subject to the provisions of R.S. 4438a, as amended (46 U.S.C. 224a), shall have officers licensed by the Coast Guard. No person shall be engaged to perform or shall perform on board any such vessel the duties of master, chief engineer, navigating officer in charge of the watch, or engineer officer in charge of the watch unless he holds a valid license issued by the Coast Guard attesting to his qualifications to perform such duties.

(c) The phrase "* * * no person shall be engaged to perform, or shall perform on board any vessel to which this section applies, the duties of master, mate, chief engineer, or assistant engineer, unless he holds a license to perform such duties * * *" in subsection (4) of R.S. 4438a, as amended (46 U.S.C. 224a), shall be construed to mean that an uninspected vessel shall be manned as provided in this paragraph.

(1) If an uninspected vessel engages on a voyage of 12 hours or less, such vessel shall have a master and chief engineer in charge of the watch continuously. If desired, a mate may serve as navigating officer in charge of the watch as a relief for the master. If desired, an assistant engineer may serve as the engineer officer in charge of the watch as a relief for the chief engineer.

(2) If an uninspected vessel engages on a voyage of over 12 hours duration, such vessel shall have a master, mate, chief engineer, and assistant engineer and such officers shall be in charge of their respective watches continuously, except as permitted otherwise by this subparagraph. An uninspected vessel which is equipped with full pilothouse control of the propulsion machinery, thus eliminating the necessity for a continuous engineroom watch, will not be deemed to be in violation of R.S. 4438a, as amended (46 U.S.C. 224a), when manned with an appropriately licensed master and mate who shall be in charge of their respective watches continuously, and an appropriately licensed chief engineer.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4438a, as amended; 46 U.S.C. 224a; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

SUBCHAPTER Q—SPECIFICATIONS

PART 160—LIFESAVING EQUIPMENT

Subpart 160.001—Life Preservers, General

1. Section 160.001–2 is amended to read as follows:

§ 160.001–2 General characteristics of life preservers.

(a) A life preserver shall be of such construction, material and workmanship that it can perform its intended function in all weathers and at all temperatures which may be expected in the normal usage of such life preserver. No more metal or other such nonbuoyant materials shall be used than is reasonably necessary in the construction of a life preserver.

(b) A life preserver shall be capable of supporting in fresh water for 48 hours a minimum of 16.5 pounds.

(c) Life preservers the buoyancy of which depends upon air compartments, inflation, or loose granulated material are prohibited.

(d) A life preserver shall be simple in design, reversible, and capable of being quickly adjusted for secure fit to the body of a wearer of the size for which it is intended.

(e) A life preserver shall support the wearer in the water in an upright or slightly backward position, and shall provide support to the head so that the face of an unconscious or exhausted person is held above the water.

(f) A life preserver shall be capable of turning the wearer, upon entering the water, to a safe flotation position as described in paragraph (e) of this section.

(g) A life preserver shall not be appreciably deteriorated or rendered unable to perform its intended function by common oils or oil products.

(h) A life preserver shall be of a highly visible color, such as Indian Orange, International Orange, or Scarlet Munsell Red.

(i) A life preserver shall be of such construction, materials, and workmanship as to be at least equivalent to a standard type life preserver described in detail by other subparts in this part.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417a, as amended, 4426, as amended, 4488, as amended, 4491, as amended, 4492, as amended, sec. 10, 35 Stat. 428, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, secs. 6, 17, 3, 54 Stat. 164, as amended, 166, as amended, 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 404, 481, 489, 490, 395, 367, 526e, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5669; 167–38, Oct. 26, 1959, 24 F.R. 8857)

Subpart 160.012—Lights, Water: Self-Igniting (Calcium Carbide-Calcium Phosphide Type), for Merchant Vessels

2. Section 160.012–5(a) is amended to read as follows:

§ 160.012–5 Marking.

(a) The cylinder shall be legibly marked by embossing at its top end the words "TOP—ATTACH THIS END TO SHIP" and the year of manufacture. The cylinder shall be legibly marked by embossing the cylindrical shell with the brand name of the light, the words "SELF-IGNITING WATER LIGHT", the name and address of the manufacturer, and the Coast Guard approval number assigned to the device. The bottom of the water light shall be marked "BOTTOM—ATTACH THIS END TO RING LIFE BUOY".

* * * * *

3. Section 160.012–6 is amended by adding a paragraph (b) reading as follows:

§ 160.012–6 Packing.

* * * * *

(b) Instructions for securing the water light to the vessel and to the ring life buoy shall be included in the shipping container. This instruction shall show how to attach the device so that its weight is not supported by the top ring, and still allow its proper operation.

4. Section 160.012–7(b) is amended to read as follows:

§ 160.012–7 Procedure for approval.

* * * * *

(b) *Manufacturer's plans and specifications.* In order to obtain approval of self-igniting water lights, submit detailed plans and specifications including a complete bill of material, assembly drawing, parts drawings descriptive of the arrangement and construction of the device, and instructions for installation, to the Commander of the Coast Guard District in which the factory is located. Each drawing shall have an identifying drawing number, date, and an identification of the device; and the general arrangement or assembly drawing shall include a list of all drawings applicable, together with drawing numbers and alteration numbers. At the time of selection of the preapproval sample, the manufacturer shall furnish to the inspector four copies of all plans and specifications, corrected as may be required, for forwarding to the Commandant.

* * * * *

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4426, as amended, 4488, as amended, 4491, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, section 3, 68 Stat. 675; 46 U.S.C. 404, 481, 489, 367, 1333, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5669; 167–38, Oct. 26, 1959, 24 F.R. 8857)

Subpart 160.051—Inflatable Liferafts

§ 160.051–8 [Amended]

5. Section 160.051–8 is amended by changing the phrase in the first sentence of paragraph (a) from "inflatable liferaft container" to "inflatable liferaft and container".

§ 160.051–9 [Amended]

6. Section 160.051–9 *Procedure for approval* is amended by revising the reference in the last sentence of paragraph (b) from "§ 160.051–5(e) (1) through (11)" to "§ 160.051–5(e) (1) through (12)".

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416; Treasury Dept. Order 120, July 31, 1950, 15 F.R. 6521)

SUBCHAPTER R—NAUTICAL SCHOOLS

PART 167—PUBLIC NAUTICAL SCHOOL SHIPS

Subpart 167.15—Inspections

1. Subpart 167.15 is amended by inserting after § 167.15–25 a new § 167.15–30 reading as follows:

§ 167.15–30 Drydocking.

(a) Except for extensions as authorized by the Commandant, all vessels shall be drydocked or hauled out and made available for examination, and shall be examined by a marine inspector within the periods set forth in this paragraph, depending upon the service.

(1) Each vessel shall be drydocked or hauled out at intervals not to exceed 24 months if it is in salt water a total of more than 12 months in the 24-month period since it was last drydocked or hauled out.

(2) Each vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it is in salt water less than 12 months in the first 24-month period since it was last drydocked or hauled out.

(3) Each vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates exclusively in fresh water.

(b) The master, owner, or agent shall notify the Officer in Charge, Marine Inspection, at any time a vessel is to be placed on drydock or hauled out in order that an examination of the underwater portion of the vessel may be made if deemed necessary.

2. Section 167.15–50 is amended to read as follows:

§ 167.15–50 Tail shaft examination.

The outboard shaft or shafts on every nautical school ship shall be drawn for examination once at least in every 4 years: *Provided*, That, if the circumstances warrant it, the Coast Guard District Commander may extend this time to the next regular drydocking period, not to exceed 4 months.

Subpart 167.65—Special Operating Requirements

3. Section 167.65–45 is amended to read as follows:

§ 167.65–45 Notice to mariners; aids to navigation.

(a) Officers are required to acquaint themselves with the latest information published by the Coast Guard and the U.S. Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that nautical school ships navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(b) Weekly Notices to Mariners (Great Lakes Edition), published by the Commander, 9th Coast Guard District, contain announcements and information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained free of charge, by making application to Commander, 9th Coast Guard District.

(c) Weekly Notices to Mariners (Part I, Atlantic and Mediterranean) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 1st, 3d, 5th, 7th, and 8th Coast Guard Districts and the Greater Antilles Section. Foreign marine information in the Atlantic and Mediterranean area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(d) Weekly Notices to Mariners (Part II, Pacific and Indian Oceans) are prepared jointly by the U.S. Coast Guard, the U.S. Coast and Geodetic Survey and the U.S. Naval Oceanographic Office. They include changes in aids to navigation in assembled form for the 11th, 12th, 13th, 14th, and 17th Coast Guard Districts. Foreign marine information in the Pacific and Indian Oceans area is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Branch Oceanographic Offices and U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(e) All nautical school ships shall have charts of the waters on which they operate available for convenient reference at all times.

(R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4433, as amended, 4450, as amended, 4453, as amended, 4488, as amended, secs. 1 and 2, 40 Stat. 1544, 1545, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675, sec. 8, 75 Stat. 403; 46 U.S.C. 391, 392, 404, 411, 239, 222, 481, 363, 367, 390b, 50 U.S.C. 198, 33 U.S.C. 1007; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857; 167–46, Nov. 6, 1961, 26 F.R. 10609)

SUBCHAPTER T—SMALL PASSENGER VESSELS (UNDER 100 GROSS TONS)

PART 176—INSPECTION AND CERTIFICATION

Subpart 176.25—Materiel Inspections

1. Table 176.25–25(a)(2) in § 176.25–25(a)(2) is amended by canceling obsolete material regarding "vaporizing liquid" so this table reads as follows:

§ 176.25–25 Fire extinguishing equipment—S.

(a) • • •

(2) • • •

TABLE 176.25–25(a)(2)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Remove liquid, clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution, or antifreeze. Insert charged cartridge.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to be sure they are clear.
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Inspect hose and nozzle to see if they are clear. Insert charged cartridge. Be sure dry chemical is free-flowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.

• • • • •

(R.S. 4405, as amended, 4462, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 375, 416, 390b, Interpret or apply R.S. 4417, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4453, as amended, 4464, as amended, 4472, as amended, 4488, as amended, 4491, as amended; 46 U.S.C. 391, 392, 399, 404, 435, 451, 170, 481, 489; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857)

PART 181—FIRE PROTECTION EQUIPMENT

Subpart 181.01—Application and Intent

1. Section 181.01–5(a) is amended to read as follows:

§ 181.01–5 Intent.

(a) The intent of this part is to insure that each vessel is provided with safe, readily available and sufficient firefighting equipment of the type necessary to extinguish any fires which are likely to be encountered in normal operation. Due consideration will be given to hazards caused by the vessel's type of fuel, construction material, equipment, cargo, etc.

Subpart 181.30—Portable Fire Extinguishers

2. Section 181.30–1 is amended by revising Table 181.30–1(a) in paragraph (a) and by revising paragraph (c) to read as follows:

§ 181.30–1 Required number, type and location.

(a) • • •

TABLE 181.20-1(a)

Space protected	Total number extinguishers required	Type extinguishers permitted		
		Medium	Minimum size	Coast Guard classification
Wheelhouse or steering station	1	Foam Carbon dioxide Dry chemical	1¼ gallons 4 pounds 2 pounds	B-I.
Propulsion machinery space (gasoline or other fuel having a flashpoint of 110° F. or lower).	1	Foam Carbon dioxide Dry chemical	1¼ gallons 4 pounds 2 pounds	B-I.
Propulsion machinery space (diesel oil or other fuel having a flashpoint over 110° F.).	2 (none required if fixed CO_2 system is installed).	Foam Carbon dioxide Dry chemical	2½ gallons 15 pounds 10 pounds	B-II.
Vehicular spaces	1 for each 5 vehicles or fraction thereof.	Foam Carbon dioxide Dry chemical	2½ gallons 15 pounds 10 pounds	B-II.[1]
Accommodations and galley	1	Foam Carbon dioxide Dry chemical	2½ gallons 15 pounds 10 pounds	B-II.[1]

[1] Two B-I hand portable fire extinguishers may be substituted for one B-II.

• • • • • • •

(c) Vaporizing liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids are not approved and are not permitted on any vessel.

(R.S. 4405, as amended, 4462, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 375, 416, 390b. Interpret or apply R.S. 4417, as amended, 4418; as amended, 4421, as amended, 4426, as amended, 4453, as amended, 4488, as amended; 46 U.S.C. 391, 392, 404, 435, 481; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-26, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857)

PART 182—MACHINERY INSTALLATION

Subpart 182.15—Machinery Using Gasoline as Fuel

1. Section 182.15-25(a) is amended by revising Table 182.15-25(a)(1) to read as follows:

§ 182.15-25 Gasoline fuel tanks.

(a) *Materials and construction.* • • •

TABLE 182.15-25(a)(1)

Material	ASTM specification (latest edition)	Thickness in inches and gage number [1] vs. tank capacities for—		
		1 to 80 gallon tanks	More than 80 and not more than 150 gallon tanks	Over 150 gallon tanks
Nickel-copper	B127, hot rolled sheet or plate	0.037 (USSG 20) [2]	0.050 (USSG 18)	0.107 (USSG 12)
Copper-nickel	B122, alloy No. 5	.045 (AWG 17)	.057 (AWG 15)	.128 (AWG 8)
Copper	B152, type ETP	.057 (AWG 15)	.081 (AWG 12)	.182 (AWG 5)
Copper-silicon	B97, alloys A, B, and C	.051 (AWG 16)	.064 (AWG 14)	.144 (AWG 7)
Steel or iron [3]		.0747 (MSG 14)	.1046 (MSG 12)	.1793 (MSG 7)

[1] The gage numbers used in this table may be found in many standard engineering reference books. The letters "USSG" stand for "U.S. Standard Gage," which was established by the act of March 3, 1892 (15 U.S.C. 206), for sheet and plate iron and steel. The letters "AWG" stand for "American Wire Gage" (or Brown and Sharpe Gage) for nonferrous sheet thicknesses. The letters "MSG" stand for "Manufacturers' Standard Gage" for sheet steel thicknesses.

[2] Nickel-copper not less than 0.031 inch (USSG 22) may be used for tanks up to 30-gallon capacity.

[3] Fuel tanks constructed of iron or steel, which is less than 5/16-inch thick, shall be galvanized inside and outside by the hot dip process.

• • • • • • •

Subpart 182.20—Machinery Using Diesel Fuel

2. Section 182.20-25(a) is amended by revising Table 182.20-25(a)(1) to read as follows:

§ 182.20-25 Independent diesel fuel tanks.

(a) *Material and construction.* • • •

TABLE 182.20-25(a)(1)

Material	ASTM specification (latest edition)	Thickness in inches and gage number [1] vs. tank capacities for—		
		1 to 80 gallon tanks	More than 80 and not more than 150 gallon tanks	Over 150 gallon tanks
Nickel-copper	B127, hot rolled sheet or plate	0.037 (USSG 20) [2]	0.050 (USSG 18)	0.107 (USSG 12)
Steel or iron		0.0747 (MSG 14)	0.1046 (MSG 12)	0.1793 (MSG 7)

[1] The gage numbers used in this table may be found in many standard engineering reference books. The letters "USSG" stand for "U.S. Standard Gage," which was established by the act of March 3, 1892 (15 U.S.C. 206), for sheet and plate iron and steel. The letters "MSG" stand for "Manufacturers' Standard Gage" for sheet steel thicknesses.

[2] Nickel-copper not less than 0.031 inch (USSG 22) may be used for tanks up to 30-gallon capacity.

• • • • • • •

(R.S. 4405, as amended, 4462, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 375, 416, 390b. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4453, as amended, 4488, as amended; 46 U.S.C. 391, 392, 404, 435, 481. Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857)

PART 185—OPERATIONS

Subpart 185.30—Markings Required

Section 185.30-1(a) is amended to read as follows:

§ 185.30-1 Hull markings.

(a) Certain markings on the hull are required by the Customs Regulations. Details of the application of the requirement as well as details of the required markings will be found in those regulations. Documented vessels should have the following markings (block letters and numerals):

(1) The name of the vessel—on both bows and the stern, not less than 4 inches high.

(2) Hailing port—on the stern, not less than 4 inches high.

(3) Draft marks—on the stem and stern of all vessels 50 gross tons and over, 6 inches high.

(4) Official number—on the vessel's main beam, not less than 3 inches high.

(5) Net tonnage—on the vessel's main beam, not less than 3 inches high.

* * * * *

(R.S. 4405, as amended, 4462, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 375, 416, 390b. Interpret or apply R.S. 4417a, as amended, 4495, as amended, sec. 3, 72 Stat. 1754; 46 U.S.C. 46, 493, 527a; Treasury Dept. Orders 120, July 31, 1950; 15 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857)

PART 187—LICENSING

Subpart 187.05—General Requirements

Section 187.05-5(a) is amended to read as follows:

§ 187.05-5 Sea service as member of Armed Forces of the United States and on vessels owned by the United States as qualifying experience.

(a) Sea service as member of the Armed Forces of the United States will be accepted as qualifying experience for an original or extension of route of license. The applicant shall submit an official transcript of sea service as verification of the service claimed when he submits an application. Such service will be subject to evaluation by the Officer in Charge, Marine Inspection, to determine its equivalence to the sea service required on passenger motorboats, and to determine the appropriate class and limit of license for which the applicant is eligible.

* * * * *

(Secs. 7 and 17, 54 Stat. 165, as amended, 166, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 526f, 526p, 390b; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894)

Subpart 187.10—Original License

§ 187.10-10 [Amended]

2. Section 187.10-10 *Written application* is amended by revising in paragraph (a) the reference to a Coast Guard Form from "CG-866, License Application" to "CG-866, License and Renewal Application".

Subpart 187.15—Renewal of Licenses

§ 187.15-1 [Amended]

3. Section 187.15-1 *Requirements for renewal of license* is amended by changing the reference in paragraph (b) from "CG-3479, Application for renewal of license," to "CG-866, License and Renewal Application".

§ 187.15-5 [Amended]

4. Section 187.15-5 *Application for renewal* is amended by revising in paragraph (a)(1) the reference from "CG-3479" to "CG-866, License and Renewal Application".

(Secs. 7 and 17, 54 Stat. 165, as amended, 166, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 526f, 526p, 390b; Treasury Dept. Orders 120, July 31, 1950, 15 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894)

Dated: November 30, 1966.

[SEAL] P. E. TRIMBLE,
Vice Admiral, U.S. Coast Guard,
Acting Commandant.

[F.R. Doc. 66-13021; Filed, Dec. 5, 1966; 8:45 a.m.]

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